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WALNUT SUPPLY AND PRICE SITUATION

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OBJECTS OF THIS STUDY

This study is one of a series on the various crops and products of California. The object of making it was to assemble, analyze and present in convenient form such facts and figures bearing on the California walnut industry as would help walnut growers understand economic conditions in their industry. Developments in any industry result from many independent actions taken by individuals. If each individual has a clear understanding of the industry as a whole, the combined action of all is most likely to result in sound development for the industry. It is hoped that the facts herein presented will promote such an understanding.

Growers can readily keep up to date some of the more important tables by entering additional figures as they become available from the sources mentioned.

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WALNUT SUPPLY AND PRICE SITUATION[1, 2]

H. E. ERDMAN[3] AND W. U. FUHRIMAN[4]

SUMMARY

Three kinds of nuts are produced on a commercially important scale in the United States—walnuts, pecans, and almonds. The United States production of two of these—almonds and walnuts—is confined almost entirely to California. Pecans are grown in the southern states from Texas to North Carolina.

Walnut acreage in California has increased rapidly. Of the total walnut acreage of 1929, 31 per cent is not yet in bearing, and probably not over 40 per cent is in full bearing.

The production of walnuts in California has increased at the rate of about 6.5 per cent a year. Whether recent heavy planting will maintain or increase the rate of growth in production will depend upon a number of factors. Chief among these are the facts that (1) some of the newer plantings are on inferior land on which yields will be disappointingly small; (2) current high prices for Valencia oranges are leading some growers to pull up walnut trees and plant to Valencia oranges; (3) in Los Angeles and Orange counties some walnut acreage is being subdivided; (4) difficulties of controlling pests may lead some growers to pull up orchards; and (5) soil, water or irrigation problems are developing in some sections. In spite of these difficulties, prospects are for further increases in production in California.

[1] Paper No. 2, The Giannini Foundation of Agricultural Economics.

[2] The following organizations and individuals have given the authors generous assistance in the preparation of this bulletin: the California Walnut Growers Association, the California Cooperative Crop Reporting Service, the Statistical and Historical Division of the United States Bureau of Agricultural Economics, and the Bureau of Foreign and Domestic Commerce. Members of the University staff from whom numerous suggestions have been received are: R. W. Hodgson, L. D. Batchelor, W. B. Hooper, and S. W. Shear. Assistance is also acknowledged from Mrs. M. J. Abbott, Carl A. Scholl, Mrs. Ruth Howe, George Gardner, A. H. Bledsoe, and H. E. Tilden.

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Production in certain foreign countries is likewise increasing. Unless purchasing power in these countries increases they will probably continue to offer keen competition to California producers. Imports both of shelled and unshelled walnuts have, however, decreased during the past three years (see table 11).

The main foreign walnut-producing countries are, in order of their importance, France, Roumania, Italy, and China. France is by far the greatest producer of walnuts and has supplied about 25 per cent of our unshelled and 70 per cent of our shelled imports during recent years. Italy has supplied around 45 per cent of our unshelled imports. China has supplied about 16 per cent of the unshelled and 17 per cent of the shelled imports of the United States. Roumania sends but few walnuts to the United States, but its crop is a large factor in the European trade. The exports from France, Italy, and China have increased materially since pre-war years, and the United States has absorbed most of this increase. Since most of the California crop is sold unshelled, it is the imports of unshelled walnuts that compete most directly with the California crop. A rapid increase in California production may bring about a decrease in the unshelled imports to the United States in the future by keeping prices in the United States at so low a level that foreign producers will find other markets more profitable.

A factor that must be considered by California producers of walnuts is the increasing production of pecans. Recent heavy plantings in the southeastern part of the United States are of budded stock and may be expected to lead to greatly increased production.

NUT GROWING IN THE UNITED STATES

Three kinds of nuts are produced on a commercially important scale in the United States—walnuts, pecans, and almonds.[5] Over 99 per cent of the almond trees and about 92 per cent of the walnut trees in the United States are in California.[6] Pecan growing, on the other hand, is centered in the belt extending from central Missouri across Oklahoma to south central Texas and to the coastal plain in Georgia, the Carolinas, Alabama, Mississippi, and nothern Florida. About one-half of the pecan trees are in Texas and Georgia.

Nut growing has increased rapidly in the past fifteen years. Just how rapidly it is difficult to say in exact percentage. The United States census reports the number of trees for recent cenus periods including that of 1920, but in the 1925 census of agriculture the number of almond and walnut trees are not mentioned. The number of trees per acre varies widely from section to section, and earlier plantings were much closer than later ones. A calculation made by the writers indicates, however, that from 1910 to 1925 bearing acreage has increased roughly 375 per cent for almonds, 175 per cent for pecans, and about 140 per cent for walnuts. From the point of view of California walnut growers, the prospective growth of the pecan acreage is probably of most importance because price studies thus far made seem to indicate that serious competition may be met from that source.

Census figures on the number of pecan trees are not satisfactory. They have obviously included only a portion of the wild trees from which nuts are harvested. There is no doubt, however, that there has been a rapid increase in the number of bearing trees and that the peak of bearing acreage is not yet in sight.[7] Moreover, there is a rapid increase in the number of budded trees and the 1925 census figures for non-bearing trees probably represent largely budded trees.

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[5] Peanuts should perhaps be mentioned as a fourth group, since to some extent they compete with other nuts, particularly for confectionary and baking purposes.

[6] According to the United States Census of 1920, California had 91.7 per cent of the bearing and 78 per cent of the non-bearing trees. See table 1, p. 8.

[7] The census figure for 1925 is 4,434,000 bearing and 4,439,000 non-bearing trees. At 15 trees per acre, this would mean 295,633 acres of bearing and 295,965 acres of non-bearing pecan trees. (See: U. S. Com. U. S. census of agriculture; summary of states **1925**:48. 1928, and Fourteenth census of the United States, 1920; Agriculture **5**:874. table 150. 1923.) A comparison of figures on pecan production (United States Department of Agriculture. Yearbook of Agriculture **1927**:865. 1928.) and census figures on number of trees in various states (U. S. Dept. Com. U. S. census of agriculture; summary by states **1925**:48. 1928.) leads the authors to believe that the number of trees reported is too low in the states in which most of the trees are seedlings, particularly in Arkansas, Oklahoma, Louisiana, and Texas.

In the case of almonds the bearing acreage may have reached its peak in 1929 unless recent fairly profitable prices bring on increased plantings. The peak of bearing acreage of walnuts is probably several years ahead unless there develops increased pulling up of orchards because of cultural difficulties in certain sections of the state or because prices of Valencia oranges hold up well for a few more years.

The only important walnut-growing area outside of California is in the Willamette Valley of Oregon and the adjoining counties of Washington. This area has somewhat more than 5,000 acres.[8] In 1920 this area had 7 per cent of the bearing and 19.2 per cent of the non-bearing walnut trees of the country. Less than 2 per cent of the United States total were outside of Pacific Coast states in 1920.

TABLE 1

BEARING AND NON-BEARING WALNUT TREES AND AVERAGE NUMBER OF TREES PER FARM REPORTING, IN PACIFIC COAST STATES, IN AREA OUTSIDE OF PACIFIC COAST STATES, AND IN THE UNITED STATES, 1920

	Bearing			Non-bearing		
	Number of trees*	Average number per farm reporting	Per cent of total	Number of trees*	Average number per farm reporting	Per cent of total
California	1,274,434	82.19	91.7	455,814	51.24	78.2
Oregon	88,695	27.64	6.4	93,214	21.95	16.0
Washington	10,703	10.68	0.8	18,760	14.00	3.2
Remainder of the U. S.	16,229	3.98	1.1	15,454	3.94	2.6
Total U. S.	1,390,061	.....	100.0	583,242	.....	100.0

* Fourteenth Census of the United States, 1920; Agriculture, **5:879**, *table* **153**. 1923. Trees per farm reporting calculated by authors from census data. The data of Table 1 are now nearly a decade old. The 1925 Census of Agriculture does not give comparable data, but the relationships shown above have not changed appreciably since 1920.

WALNUT-PRODUCING AREAS OF CALIFORNIA

Distribution of Walnut Acreage.—The larger and most specialized walnut-growing region of California, comprising 76 per cent of the bearing and 67 per cent of the non-bearing acreage in 1929, lies in the southern part of the state and is scattered over parts of six counties—Los Angeles, Ventura, Orange, San Bernardino, Riverside, and Santa Barbara.

[8] Unofficial estimates place total Oregon acreage at 8,000 or 9,000 acres. Schuster, C. E. Walnut growing in Oregon. Diamond Walnut News, **10** (5): 8–9. Dec., 1928.

WALNUT ACREAGE BY COUNTIES, 1929

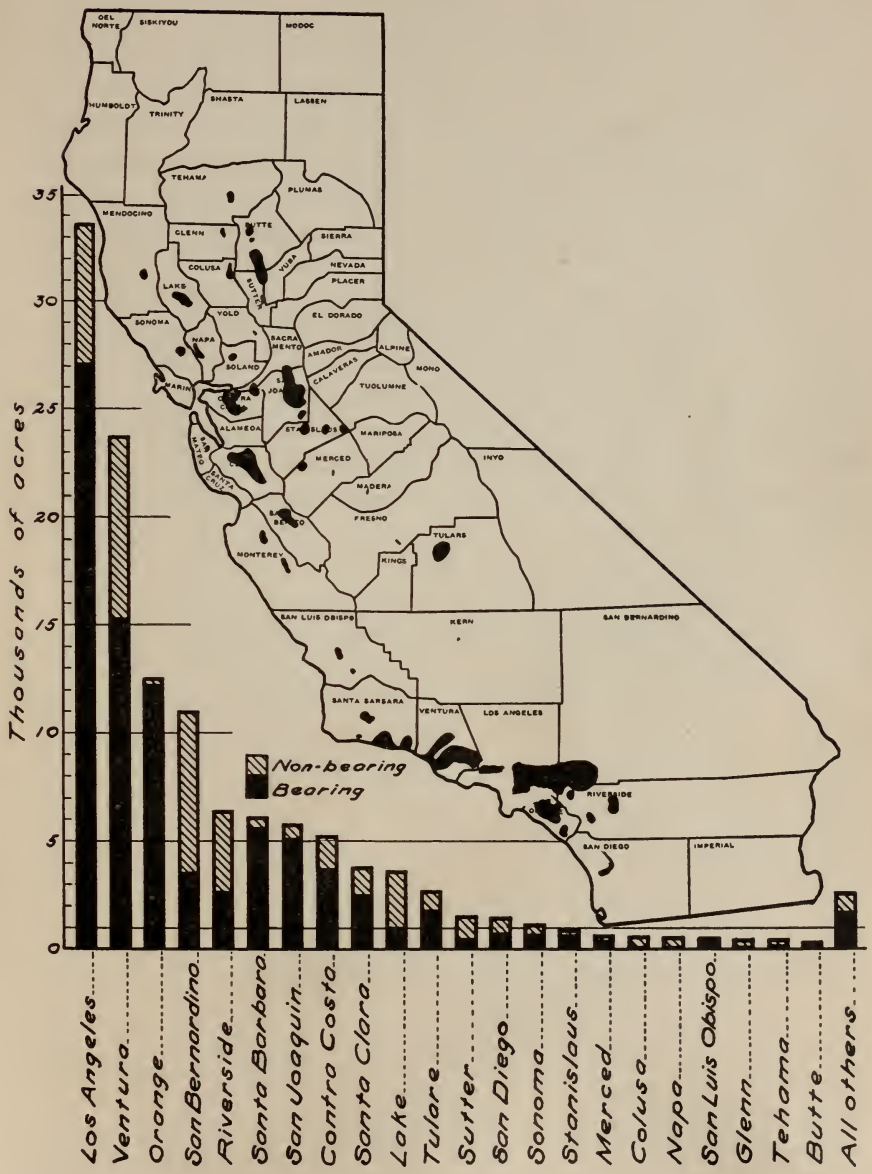

Fig. 1.—The principal walnut-growing areas are in southern California. On the whole, the acreage is in scattered areas, some of which lies as far north as Tehama County.

The walnut acreage outside of the above district is distributed rather widely over the state. The San Joaquin County area east of Stockton extends from Galt to Farmington. The Walnut Creek area of Contra Costa County extends from a distance north of Concord to a little south of Danville. The Santa Clara area includes the country from north of San Jose to Gilroy and extends west to Los Gatos. Another area lies along the south shore of Clear Lake in Lake County. An area near the city of Visalia in Tulare County has considerable acreage. These five counties have about 16 per cent of the total walnut acreage. The remaining 9 per cent of the acreage is in small widely scattered areas. The map in figure 1 pictures the distribution of walnut areas in a general way. The bar diagram at the bottom of figure 1 shows the bearing and non-bearing acreage for the more important counties. A large proportion of non-bearing acres in any county indicates that plantings have been relatively extensive there during recent years. Outside of the counties of the southern California district, already mentioned, Santa Clara, Lake, San Diego, and several less important counties show a relatively large proportion of non-bearing trees.

TABLE 2

CALIFORNIA WALNUT ACREAGE AND PLANTINGS, 1914–1929, AND FORECASTS OF BEARING ACREAGES, 1930–1932

Year	Bearing acres	Non-bearing acres*	Plantings†	Year	Bearing acres	Non-bearing acres*	Plantings†
1914	34,138	13,132‡	.....	1926	71.779	43.079	9.672
1915	34,453	20,363‡	.....	1927	75,307	50,657	4,772
1916	35,379	20,581‡	.....	1928	83,252	46,460	3,022
1917	45,687	22,277‡	.....	1929	87,564	39,921	.....
1918	48,520	18,809‡	.....				
1919	50.900	.....	.....		Forecast		
1920	58,963	.....	.....				
1921	61,781	20,862§	2,405				
1922	65,530	21,546¶	6,844	1930	93,700	.....	.....
1923	66,951	25,000	7,912	1931	101,300	.....	.....
1924	68,572	29,084	9,335	1932	107,500	.....	.....
1925	69,629	36,700	7,913				

* Does not include plantings of the current years.

†Plantings during Jan.-Mar. of years indicated. From annual issues of the California Crop Report. California State Dept. Agr.

‡ California State Comm. of Hort. Mo. Bul. 1914–1919.

§ Letter from N. I. Nielson, Fruit Statistician, California Coop. Crop Rept. Service, Mar. 16, 1929.

¶ California State Dept. Agr. Mo. Bul. 12:363. July-Dec. 1923.

Data taken from annual reports of California Cooperative Crop Reporting Service unless otherwise indicated.

Trend of Bearing Acreage.—The bearing acreage of walnuts in California increased rapidly from 1916 to 1922. From 1922 to 1926, the increase was not so rapid. Beginning with 1927 acreage has again

increased more rapidly. In view of the fact that nearly a third of the total California walnut acreage of 1929 is non-bearing, and that the plantings during the past five years have averaged nearly 7,000 acres a year, it is apparent that increases in bearing acreage may be expected for several years to come. (See, however, the elements of uncertainty mentioned on page 17.)

Table 2 gives the data for bearing acreage back to 1914 and for non-bearing acreage and plantings as far as data are available. The non-bearing acreage has increased each year for which data are available since 1918, except during the last two years.

WALNUT PRODUCTION IN THE UNITED STATES[9]

California has in recent years furnished about 97 per cent of the walnuts produced in the United States. Outside of California, Oregon is the most important walnut-producing state and in 1928 produced about 1,000 tons, or about 4 per cent of California production. The production of walnuts in Oregon may be expected to increase considerably because of plantings in recent years, but this increase will not soon be a large factor in the total United States production. The production of walnuts outside of the three Pacific Coast states is probably not far from 1 per cent of the California production. In comparison with the total this is an insignificant amount, most of which doubtless is sold in scattered local markets.

The increase in the California walnut crop during the past twenty-nine years is shown in table 3 and figure 3.[10] In general, the rate of increase in production has been fairly steady throughout this entire

[9] for a discussion of the varieties of walnuts grown in California see: Batchelor, L. D., and O. Lee Braucher. Walnut culture in California. California Agr. Exp. Sta. Bul. 379. 1929. (In press.)

[10] *Significance of semi-logarithmic or ratio charts.*—In picturing statistical data it is often desirable to emphasize comparisons of percentage or proportional changes rather than absolute amounts. For the purpose of showing such relative changes, a ratio scale, such as the vertical scale in figure 3, is most useful. Equal vertical distances on the semi-logarithmic paper on which the figure is plotted picture equal percentages (rates) of change. For convenience in plotting and reading, however, the scale has been numbered in thousands of tons. With the usual or arithmetic scale on ordinary cross-section paper such as was used in figure 2, the distance between the vertical lines 20 and 40 is twice as great as the distance from 10 to 20. In figure 3, however, the distance between 20 and 40 is just equal to the distance from 10 to 20, for the reason that 20 bears the same ratio to 40 that 10 does to 20. It is obvious that 20 is twice as great as 10; in other words, 20 is 100 per cent greater than 10. Likewise 40 is twice as great as 20, or in other words 40 is 100 per cent greater. Equal distances on the scale correspond to equal relative or percentage changes, and not, as in figure 2, to equal absolute differences. Equal percentage increases over a series of years, when plotted on semi-logarithmic paper, are represented by a straight line.

period. The trend line indicates that there has been approximately a constant percentage increase of 6.5 per cent from year to year over the period. That is, each crop has normally been 6.5 per cent larger than the crop of the previous year. Measured in tons of walnuts produced, the increase has been growing larger each year. Thus the normal increase of 1910 over 1909 was 660 tons; that of 1920 over 1919 was 1,200 tons, and that of 1928 over 1927 was about 1,980 tons.

TABLE 3

CALIFORNIA WALNUT PRODUCTION (ORCHARD RUN), 1895–1928, TREND OF PRODUCTION, AND DEPARTURE FROM TREND

Year	Actual production* *tons*	Trend of production† *tons*	Percentage which actual is of trend *per cent*‡
1895	3,385	4,127	82.02
1896	6,200	4,393	141.13
1897	4,610	4,678	98.54
1898	5,650	4,980	113.45
1899	5,580	5,302	105.24
1900	5,430	5,644	96.20
1901	6,900	6,009	114.82
1902	8,570	6,398	133.94
1903	5,500	6,811	80.75
1904	7,590	7,251	104.67
1905	6,400	7,720	82.90
1906	7,000	8,219	85.16
1907	7,400	8,750	84.57
1908	9,200	9,315	98.76
1909	9,350	9,918	94.27
1910	9,600	10,560	90.90
1911	12,500	11,220	111.40
1912	11,250	11,970	93.98
1913	11,350	12,740	89.08
1914	8,900	13,560	65.63
1915	14,825	14,440	102.69
1916	14,600	15,370	94.99
1917	16,500	16,370	100.79
1918	19,950	17,430	114.45
1919	28,100	18,550	151.48
1920	21,000	19,750	106.32
1921	19,500	21,030	92.72
1922	27,000	22,390	120.58
1923	25,000	23,830	104.90
1924	22,500	25,380	88.65
1925	36,000	27,020	133.23
1926	15,000	28,760	52.15
1927	51,000	30,620	166.56
1928	25,000	32,600	76.68
1929	.....	34,710	.....
1930	.....	36,950	.....

* Kaufman, E. E. A California Crop Report for 1927. California Dept. Agr. Spec. Pub. 86: 35. 1928.

† The trend of production has shown a constant percentage increase of about 6.5 per cent yearly. Actual calculations by method of least squares. The figures for 1929 and 1930 are *not* predictions.

‡ Calculation by dividing actual by trend figures.

California Walnut Acreage, Bearing and Non-Bearing, 1914–1929, and Forecasted Bearing Acreage, 1930–1932

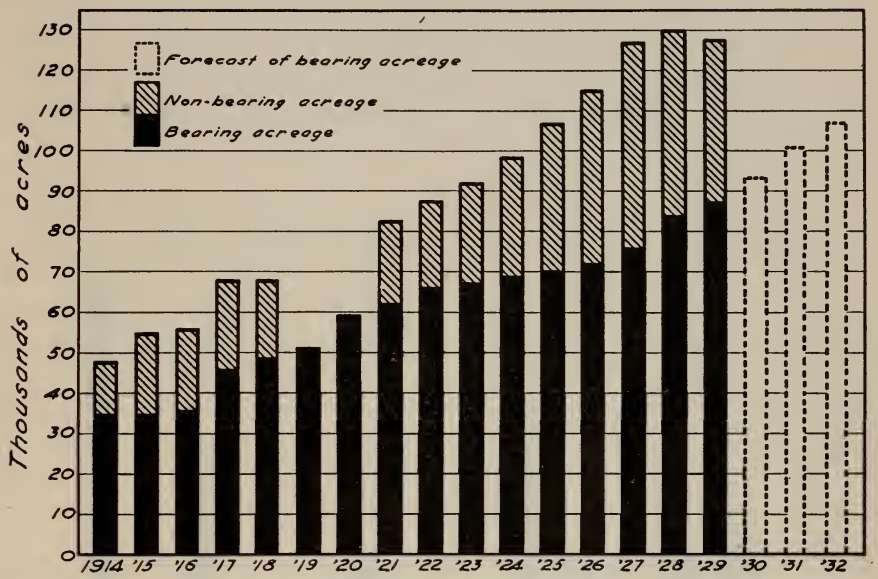

Fig. 2.—Bearing acreage of walnuts has shown a rapid increase in recent years.

California Walnut Production (Orchard Run), 1895 to 1928, and Trend of Production

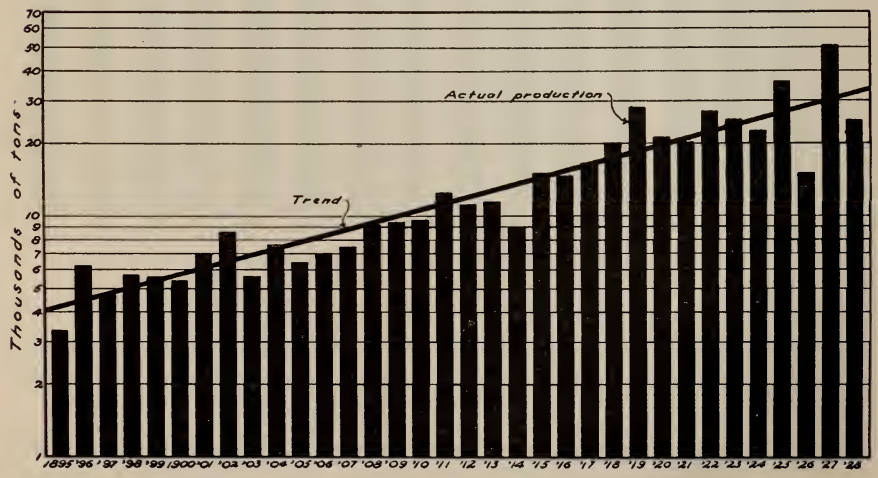

Fig. 3.—Production has increased at the rate of about 6.5 per cent each year since 1895.

The annual crops have, of course, varied greatly from this trend as is shown in figure 3 and in column 3 of table 3. These variations have increased, not only absolutely, but also relatively. Such abrupt changes in supply lead to difficulties in marketing. An enormous crop one year requires strenuous sales effort if the crop is to be moved without ruinous cuts in price. Any permanent results of such effort are likely to be lost if consumer habits or trade interest cannot be capitalized because of a short crop the next year.

AVERAGE YIELD PER BEARING ACRE OF CALIFORNIA WALNUTS, 1914–1928

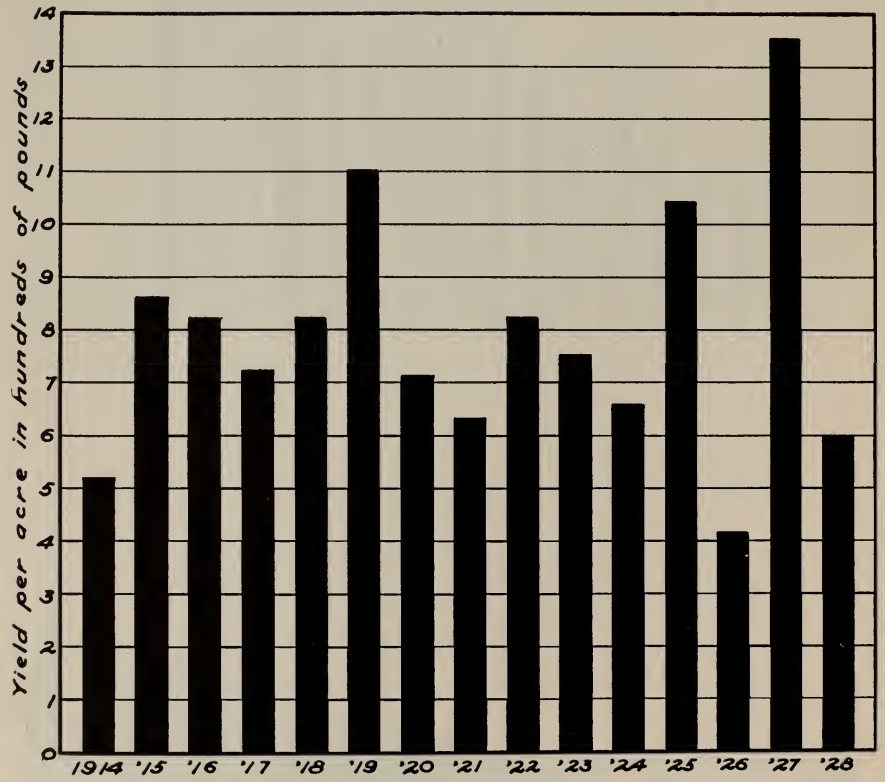

Fig. 4.—Yields of bearing walnut acreage in California have varied widely.

Table 5 gives production of merchantable walnuts by county and by section. The group of counties north of the Tehachapi Mountains has been increasing in importance, as indicated by a rise in the percentage of the total merchantable crop produced.

Future trend of California Production.—Judging from present conditions, interpreted in the light of previous experience, it seems reasonable to expect a big increase in production of walnuts during

the next few years. The non-bearing walnut acreage of California is at present nearly half as large as the bearing acreage. Although 69 per cent of the acreage of 1929 is reported as bearing acreage, it is probable that not over 40 per cent of it is in full bearing, i.e., only about 40 per cent of the acreage has trees 16 years or more of age.[11] These facts point definitely to increased bearing acreage.

During the past fifteen years, the bearing acreage has been a fair index to the trend of walnut production in California. During this period the average production has been around two-fifth of a ton (800 pounds) per bearing acre, as shown in table 4 and figure 4. The figures on average yield do not show any trend toward increased yields per acre from the numerous improvements in production or from the adoption of improved varieties, which in observed individual cases always lead to increased yields. Any favorable results are hidden in the averages because there are many instances where yields have decreased because certain production difficulties have become more general, because the percentage of partly bearing acreage has increased, or because lower-yielding lands have been planted.

TABLE 4

Bearing Acreage, Total Production, and Average Yield per Bearing Acre of Walnuts in California, 1914–1928

Year	Bearing acreage 1	Production 2	Average yield per acre 3
	acres	*tons*	*pounds*
1914	34,138	8,900	521
1915	34,453	14,825	860
1916	35,379	14,600	825
1917	45,687	16,500	722
1918	48,520	19,950	822
1919	50,900	28,100	1,104
1920	58,963	21,000	712
1921	61,781	19,500	631
1922	65,530	27,000	824
1923	66,951	25,000	747
1924	68,572	22,500	656
1925	69,629	36,000	1,034
1926	71,779	15,000	417
1927	75,307	51,000	1,354
1928	83,252	25,000	600

Sources of data: Cols. 1 and 2 taken from: Kaufman, E. E., California Crop Report for 1927. California Dept. of Agr., Spec. Pub. **86:** *tables* **22** and **18**. 1928. Col. 3 computed by converting figures in col. 2 into pounds and dividing by corresponding figure in col. 1.

[11] Cowan, Con G. Taking the guesswork out of walnut marketing. Diamond Walnut News, **11** (2):10. Apr., 1929. Estimate is made that in 1928, 35.8 per cent of total trees were non-bearing, 24.3 per cent in partial bearing, and only 39.9 per cent in full bearing.

TABLE 5

PRODUCTION OF MERCHANTABLE WALNUTS BY COUNTIES, 1922–1928

County	Tons of merchantable walnuts							Per cent of total			
	1922	1923	1924	1925	1926	1927	1928	1922	1923	1927	1928
Contra Costa	338.9	580.4	669.30	716.38	940.78	1,583.0	1,157.4	1.4	2.4	3.8	5.5
Los Angeles	7,583.9	6,311.13	5,922.55	8,186.85	3,249.31	9,921.4	4,336.3	30.3	25.8	23.7	20.6
Napa	27.1	30.65	35.46	14.20	29.77	29.7	35.8	.1	.1	.07	.2
Orange	7,851.4	7,447.64	6,114.11	7,684.98	2,235.09	12,398.8	3,881.9	31.3	30.5	29.6	18.4
Riverside	166.5	284.94	469.58	649.72	358.72	824.4	631.5	.7	1.2	2.0	3.0
San Bernardino	423.9	586.83	549.58	852.22	396.87	1,309.2	746.1	1.7	2.4	3.1	3.6
San Joaquin	85.6	210.23	241.54	244.57	77.50	505.6	826.8	.3	.9	1.2	3.9
San Luis Obispo	.....	119.79	19.80	59.50	40.00	160.2	155.5	.....	.5	.4	.7
Santa Barbara	2,552.2	2,237.81	1,434.70	1,729.18	560.48	2,903.5	1,295.3	10.2	9.2	6.9	6.2
Santa Clara	346.4	773.92	949.37	1,027.82	735.95	1,376.5	1,204.1	1.4	3.2	3.3	5.7
Tulare	94.1	152.24	137.80	156.42	189.81	325.4	341.9	.4	.6	.8	1.6
Ventura	5,540.8	5,556.57	4,695.06	7,246.55	2,712.86	9,974.5	6,135.0	22.1	22.7	23.8	29.1
Miscellaneous*	.....	112.86	166.52	305.92	213.32	438.5	316.6	.....	.5	1.0	1.5
Total for state	25,010.7	24,405.01	21,405.37	28,874.32	11,740.46	41,750.7	21,061.2	100	100	100	100
South of Tehachapi	24,118.6	22,424.92	19,185.53	26,549.50	9,613.65	37,681.5	17,232.5	96.4	91.9	90.2	82.0
North of Tehachapi	892.1	1,980.09	2,219.79	2,324.82	2,126.81	4,069.2	3,828.7	3.6	8.1	9.8	18.0

* Estimated tonnage to cover roadside sales, home consumption, and counties not included above.

Source of data: Annual statements by California Walnut Growers Association.

Assuming then, that yields will not change greatly in the immediate future, the forecasted bearing acreage becomes our best guide to future production. The forecasted bearing acreage for 1930 is 7.0 per cent above that of 1929; the forecasted acreage for 1931 is 8.1 per cent above that for 1930; and that for 1932 is 5.9 per cent above the figure for 1931. The yearly increase in the trend of production, it will be recalled, has been about 6.5 per cent.

Certain elements of uncertainty must, however, be considered with any look ahead. At least five factors tend to offset the expected increases in production from new plantings. They are: (1) Some of the newer plantings are on inferior land which will produce disappointingly low yields. (2) Valencia oranges are in some instances replacing some of the less profitable walnut groves. (3) In Los Angeles and Orange counties some walnut acreage is being subdivided for residential purposes. (4) In some cases increased difficulty of controlling pests may cause growers to pull up walnut orchards, particularly where alternative crops pay well. The codling moth in particular is threatening in some areas. (5) Drainage and alkali difficulties are developing in some areas and may lead to the pulling up of some acreage.

It is not possible at this time to tell how important these factors are to become. Some may fade into insignificance as control measures are discovered, whereas others may become increasingly important.

MARKET CLASSIFICATION OF CALIFORNIA WALNUTS

The California Walnut Growers Association, which handles about 85 per cent of the California walnut crop, has found it advantageous to standardize its grades so that walnuts packed by various local associations can be sold with full assurance that they will come up to specifications set forth by the standardization committee of the central association. Grading standards were in process of development even before the formation of the present association in 1912, when a rather loose association known as the Walnut Growers Association of Southern California was in existence. Particular attention has been given to the subject of grade standardization during the past decade.

The California market classification of walnuts is based on a combination of quality, size, and variety characteristics, as indicated in the following:

MARKET CLASSIFICATION OF WALNUTS

Brand	*Size*	*Variety*	*Market classification*
Diamond	Large	Seedlings	Diamond No. 1 Soft Shell
		Buds	Diamond Large Buds
		Fancies	Diamond Large Fancies
	Medium	Seedlings	Diamond No. 1 Soft Shell
		Buds	Diamond Medium Buds
		Fancies	Diamond Medium Fancies
	Small	Seedlings, Buds, Fancies	Emerald Babies[12]
Emerald	Large	Seedlings	Emerald No. 1 Soft Shell
		Buds	Emerald Large Buds
		Fancies	Emerald Large Fancies
	Medium	Seedlings	Emerald No. 1 Soft Shell
		Buds	Emerald Medium Buds
		Fancies	Emerald Medium Fancies
	Small	Seedlings, Buds, Fancies	Emerald Babies
California	Large	Seedlings	California No. 1 Soft Shell
		Buds	California Large Buds
		Fancies	California Fancies
	Medium	Seedlings	California No. 1 Soft Shell
		Buds	California Medium Buds
		Fancies	California Fancies
	Small	Seedlings, Buds, Fancies	California Babies

The central association maintains an inspection system under which a sample from every shipping lot is subjected to a cracking test before the lot leaves the state in order that shipments comply with specifications. The samples and cracking tests are retained at the central office, but in case of dispute a final sample is also taken at destination. Briefly the specifications for the market classification may be set forth as follows:

1. Quality classification—brands.

   Diamond—90 per cent sound, edible kernels; 60 per cent light, rest may be amber.

   Emerald—86 per cent sound, edible kernels; 40 per cent light, rest may be amber.

   California—80 per cent sound, edible kernels.

[12] Small nuts of Diamond quality are now sold under the Emerald brand.

2. Size classifications.

Large, Medium, Small } (Based on specific size of openings in grading screens through which nuts do or do not pass. Range in size of openings is from $^{6}/_{64}$ inches in diameter to $^{7}/_{64}$ inches.)

3. Variety classifications.

Seedlings—mainly soft shells.

Buds—budded or grafted varieties, mainly Placentia.

Fancies—Mayette, Franquette, Concord, Payne, Eureka.

California Walnut Growers Association Shipments of Merchantable Walnuts by Market Classifications, 1928

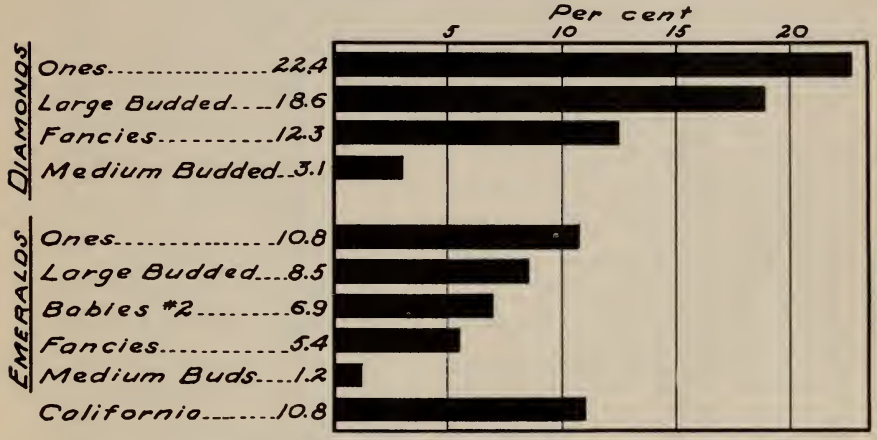

Fig. 5.—Almost two-thirds of the merchantable walnuts are shipped under the Diamond Brand.

Table 6 gives the percentage of nuts shipped under various market classifications by the California Walnut Growers Association from 1914 to 1928. It also shows the change in classification which was adopted with the opening of the 1926 season. It will be noticed that in recent years the relative proportion of the three quality classifications are approximately 60 per cent Diamond, 30 per cent Emerald, and 10 per cent California. These proportions, of course, vary somewhat from year to year. Figure 5 pictures the relative importance of the several market classifications of the 1928 crop of nuts. Figure 6 shows the data of table 6 plotted under the market classifications of 1914 to 1925 with the highest-priced nuts at the bottom and the lowest-priced at the top. Figure 7 pictures the same data in percentage of the total shipments each year. It will be noted that No. 1 Soft Shells which have most frequently been used as typical of the price level of any given year are decreasing in relative importance, although their production has continued roughly about constant. The change in relative importance has arisen from the rapid increase in production of Budded and Fancy varieties.

TABLE 6

PERCENTAGE OF TOTAL CALIFORNIA WALNUT GROWERS ASSOCIATION SHIPMENTS OF WALNUTS IN THE SEVERAL MARKET CLASSIFICATIONS, 1914–1928* (Culls not included)

	No. 1 Soft Shell	Fancy Budded	Standard Budded	Fancy Varieties	No. 2 Soft Shell	Near Grades†	Total
1914	89.3	6.3	0.0	0.0	4.4	0.0	100
1915	80.1	6.5	0.0	0.7	5.9	6.8	100
1916	82.9	8.9	0.0	1.5	3.2	3.5	100
1917	64.8	9.7	2.0	1.0	19.8	3.6	100
1918	76.1	12.5	1.3	1.0	4.9	4.2	100
1919	66.9	11.9	2.5	1.8	15.0	1.9	100
1920	68.2	16.2	1.0	4.3	4.6	5.7	100
1921	58.5	16.4	3.0	4.5	6.9	10.7	100
1922	62.7	18.3	2.0	4.6	4.1	8.3	100
1923	63.8	20.1	0.0	6.6	6.4	3.1	100
1924	54.5	22.8	2.8	8.4	7.4	4.1	100
1925	49.4	20.4	4.8	7.8	7.3	10.3	100

NEW CLASSIFICATION‡

	Diamond No. 1 Soft Shell	Emerald No. 1 Soft Shell	Diamond Large Budded	Emerald Large Budded	Diamond Medium Budded	Emerald Medium Budded	Diamond Fancies	Emerald Fancies	Emerald Babies	California	Total
1926	20.8	18.1	17.7	12.9	1.5	0.8	8.9	7.9	4.6	6.8	100
1927	21.1	16.9	16.9	4.5	7.9	2.1	7.1	1.7	13.3	8.5	100
1928	22.4	10.8	18.6	8.5	3.1	1.2	12.3	5.4	6.9	10.8	100

* Data from California Walnut Growers Association.

† Near grades 1916–1925; Off-Grades 1914–1915; California, 1926–1928.

‡ Each of the four higher grades were more strictly graded in 1926 and subdivided into two brands, namely, the Diamond and Emerald. The Diamond brand requires a color count of 60 per cent light; the Emerald brand a count of 40 per cent light.

The above classifications are probably not wholly comparable from year to year because minor modifications have been made from time to time in the grading practices.[13]

WALNUT PRODUCTION IN FOREIGN COUNTRIES

California walnuts naturally come into competition with walnuts grown in other parts of the world. California production has in recent years amounted to less than a fifth of the worlds production. A brief picture of walnut production in other countries is, therefore, of some interest to California producers. Adequate data are unfortunately not available on many phases of the foreign situation, yet such information as we have is instructive.

France.—France is the leading walnut-producing country of the world. The walnut is one of its important farm crops and is grown widely throughout most of the country. The commercial crop, however, is largely grown in central France—the area extending roughly from Bordeaux to the Alps. In most parts the trees are scattered about among fields of other crops, though walnut orchards are not entirely absent. Two sections of special importance are the Grenoble district and a district to the east of Bordeaux.

Grenoble, situated in about the middle of the Isére Valley, is adjacent to the district in which the important varieties are Mayette, Parisienne, Franquette, and Charberte, frequently known collectively as 'Grenobles.'[14] The normal output of this district is about 3,500 tons of nuts used unshelled and about 4,000 tons used for shelling.[15]

What is sometimes called the Bordeaux district really includes two rather distinct areas, the district west of Perigueux where the Corne variety is most common,[16] and the hilly country to the east of Perigueux where the Marbot variety is grown.

[13] See, for example, Trade Cir. No. 3, September 29, 1927, issued by the California Walnut Growers Association (California Fr. News 76(2048):5. Oct. 8, 1927) in which it is pointed out that a change was made that year in respect to 'liners,' i.e., nuts that are just a shade too large to pass through the grader openings of a given grade. The effect of the change noted is slightly to increase the minimum size of both No. 1's and Large Budded, automatically throwing some nuts into the next smaller grade from that in which they previously were included.

[14] Batchelor, L. D. Walnut culture in France. Diamond Walnut News 8(2): 3–4, May–June, 1926; also 8(3):5–6, July–Aug., 1926.

[15] Thorpe, Carlyle. A journey to the walnut sections of Europe and Asia. p. 75. Privately printed, Young and McCallister, Inc., Los Angeles, 1923.

[16] *Ibid.*, pp. 87 and 91.

CALIFORNIA WALNUT PRODUCTION BY MARKET CLASSIFICATIONS
(OLD CLASSIFICATION BASIS) 1914–1928

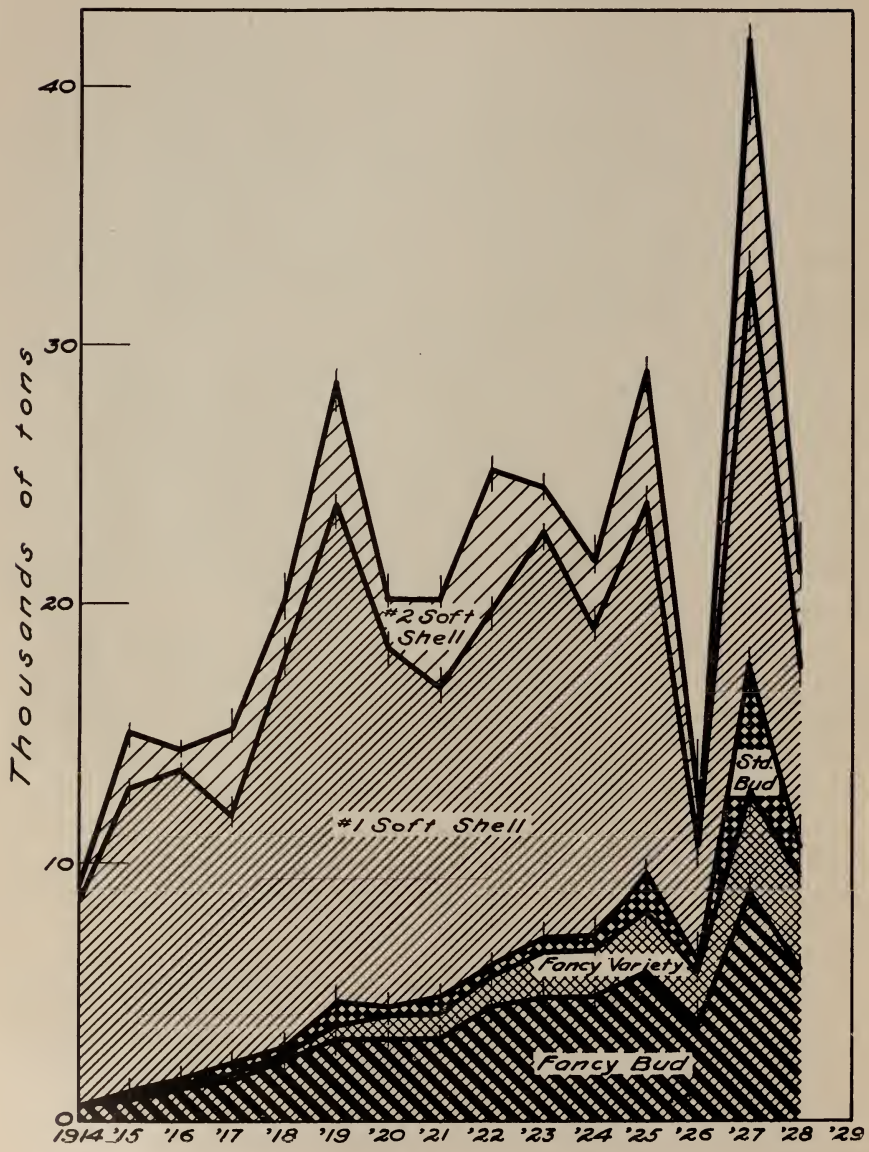

Fig. 6.—The higher-priced nuts are pictured at the bottom of the chart, the lower-priced at the top. Increases in production have been mainly in the Fancy varieties and Budded nuts. The chart is made up by applying California Walnut Growers Association shipping percentages to estimated merchantable crop figures. Data for 1926 to 1928 converted to classification used prior to that time. See table 6 for new classification.

The quantity of Cornes produced is usually about one-third more than that of Marbots. The Cornes district is the most important walnut-producing district of France.

Batchelor points out that French walnut production decreased somewhat from 1904 to 1921, but since then has been increasing. During the next ten to fifteen years the production of Marbots may be expected to continue about as at present, while Grenoble production may increase somewhat. Production in the Corne district may be expected to increase considerably.

Market Classification of California Walnuts in Percentage of Total Merchantable Production (Old Classification Basis), 1914–1928

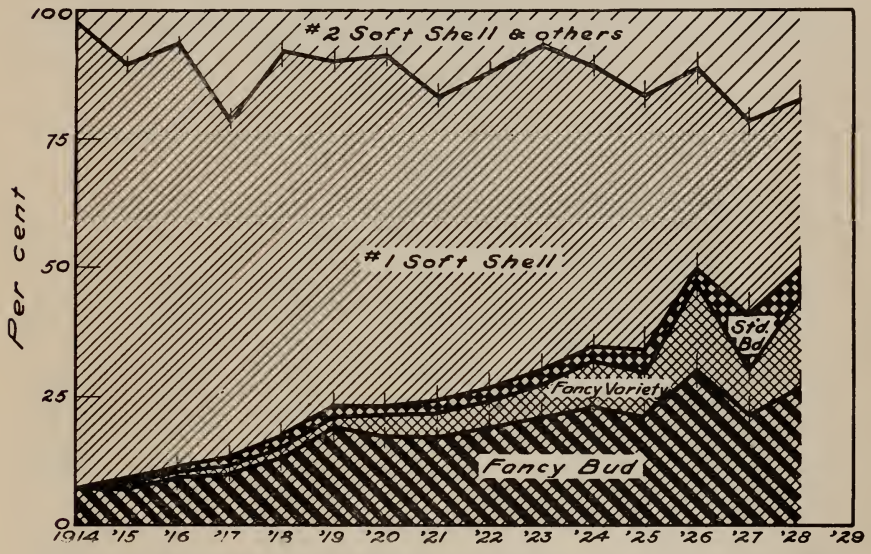

Fig. 7.—Although No. 1 Soft Shells have remained about constant in quantity, they have decreased in relative importance because of increases in the production of Fancy varieties and Budded nuts. Data for 1926 to 1928 converted to classification used prior to that time. See table 6 for new classification.

Most estimates of the usual total production of walnuts in France are between 44,000 and 55,000 tons. The most reliable information gives the production of walnuts available for export since 1922 as in table 7. Moreover, this series comes through the same sources for each year, hence the figures may be considered fairly comparable. The same authority estimates that 45,100 tons might be considered a normal crop for 1928.

The following statements show some of the discrepancies in the various statements and are typical of information on foreign crops:

VARIOUS ESTIMATES OF NORMAL PRODUCTION IN FRANCE
(Thousands of tons)

25 to 30	United States Department of Commerce (U. S. Com. Rept. 25th yr. 2(15):73. Apr. 10, 1922.)
44 (for 1918 to 1922)	United States Department of Agriculture, Bureau of Agricultural Economics (Foreign Crops and Markets 11(6):195. Aug. 10, 1925.)
55 (normal crop)	United States Department of Agriculture, Bureau of Agricultural Economics (Foreign Crops and Markets 9(21):519. Nov. 19, 1924.)
49.5 (yield in good years)	United States Department of Agriculture, Bureau of Agricultural Economics (Foreign news on nuts W12:1–2. (mimeo.) Dec. 13, 1926.)
44 ("usual estimate")	California Fruit News (Calif. Frt. News 76(2050): 17. Oct. 22, 1927.)
47 (average for past 12 years)	L. D. Bachelor (Walnut culture in France. Diamond Walnut News 8(2):3. 1926.)
45.1 (estimated for 1928)	California Walnut Growers Association representative in Europe.

TABLE 7

ESTIMATED PRODUCTION OF WALNUTS AVAILABLE FOR EXPORT IN FRANCE, 1922–1928

Year	Grenobles	Marbots	Cornes	Other table varieties	Shelling varieties	Total
	tons	*tons*	*tons*	*tons*	*tons*	*tons*
1922	4,400	4,620	2,475	.....	.....	.....
1923	1,815	2,310	3,740	5,500	27,500	40,865
1924	2,475	3,300	3,465	5,500	27,500	42,240
1925	3,960	4,235	6,435	7,700	38,500	60,830
1926	2,200	770	1,980	19,250	9,625	33,825
1927	3,300	4,950	4,950	8,800	44,000	66,000
1928	.....	.....	.....	.....	.....	.....

Source of data: Figures supplied to the California Walnut Growers Association by its European representative.

Italy.—Walnut production of Italy is greatest in the southern part of the peninsula. The most important districts are around Naples, Salerno, and Sorrento, in the west central part of the Campania Province. Most of the southern Italy crop is Sorrentos,[17] a soft-shelled variety that is easily cracked with the fingers, which is largely confined to the plains of southern Italy. The mountain variety has a thick shell and is grown on the mountain sides at altitudes of from 800 to 2,500 feet. The mountain variety, only, is grown in northern Italy. The Turin district, at the western end of the Poe Valley, is the only district of commercial walnut production in northern Italy.

[17] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, W3:1–2. (mimeo.) Aug. 21, 1925.

Estimates of the total production for Italy also vary widely. The average for the three years 1924–1926, according to the estimates of the Minister of National Economy of Italy, is about 31,500 tons a year. His estimates are considered high by the trade.[18] The Italian crop may be expected to increase considerably during the next few years. Many of the recent plantings are in orchards and may be expected to yield better than the scattered trees.

Batchelor estimates that commercial walnut production in Italy is likely to increase by 100 per cent during the next decade.[19] Most of the more recent plantings are in orchards rather than scattered plantings. Table 8 gives an estimate of walnut production available for export in Italy by commercial varieties since 1922. The normal for the crop of 1928 was placed at 9,625 tons by the Association representative.

TABLE 8

Estimated Production of Walnuts Available for Export in Italy by Commercial Varieties, 1922–1928

Year	No. 1 Naples Sorrentos	Current Naples	Wild Naples	Total
	tons	*tons*	*tons*	*tons*
1922	6,435	1,375	.....	7,810
1923	5,500	1,100	.....	6,600
1924	4,950	825	825	6,600
1925	7,425	1,375	1,045	9,845
1926	7,260	1,650	2,090	11,000
1927	8,800	1,650	1,925	12,375

Source of data: Figures supplied to California Walnut Growers Association by its European representative.

TABLE 9

Estimated Production of Walnuts Available for Export in Roumania by Districts, 1923–1928

Year	Bessarabia	Moldavia	Transylvania	Total
	tons	*tons*	*tons*	*tons*
1923	1,650	2,200	1,430	52,800
1924	5,750	7,700	2,200	15,650
1925	2,475	5,500	1,650	9,625
1926	6,600	13,750	2,750	23,100
1927	3,300	8,250	1,650	13,200

Source of data: Figures supplied to California Walnut Growers Association by its European representative.

[18] U. S. Dept. Agr. Bur. Agr. Econ. Foreign Crops and Markets, 14(17):533. Apr. 25, 1927.

[19] Batchelor, L. D. Walnut culture in Italy. Diamond Walnut News, 9(1):7. 1927.

Roumania.—Walnut trees in Roumania are rarely planted in orchard form. Trees are numerous in the hilly sections, where almost every peasant has a few trees in his yard or pasture. The production of walnuts is confined largely to the section east of the Carpathian Mountains and north of the mouth of the Danube, i.e., the provinces of Bessarabia (formerly part of Russia), Bukowina, and Moldavia. Transylvania (formerly part of Hungary), in the central mountainous part of Roumania, is also of some importance.[20]

Bessarabia is the most important section and its production has been increasing rapidly since the war. The number of walnut trees in this province is estimated to have increased from 403,156 in 1919 to 765,085 in 1922.[21] The percentage of the total crop produced in the various provinces is given as follows:

Bessarabia and Bukowina	46 per cent
Moldavia	37 per cent
Transylvania	17 per cent

The best series of data for the total production are those given in table 9. However, other estimates vary widely from those in table 9 and from each other. The normal crop for 1928 was estimated by the same authority to be 9,900 tons "available for export."

China.—The main production of commercial walnuts in China is in the northern provinces of Chihli, Shansi, and Shantung, the central province of Honan, and to some extent in the western province of Szechwan.[22] The best variety of walnut produced in China—the paper shell—is grown in the Chihli Province along the coast northeast of Tientsin, in the Tang Shan Valley about fifty miles northeast of Peking, and in an extensive area in the Shansi Province to the southwest of the city af Fen Chow.[23] A few sections in these districts are the only places in China where walnut orchards are given special care and cultivation. In most places throughout China the walnut crop is of only secondary importance to the farmer. The most important variety grown is the medium-shelled. The double-shelled, which is the lowest grade, comes next, while the paper-shell is of least importance.

In the hilly section west of Klagan and around Tatungfu between the outer and inner great Wall in Shansi, around Tsing Chow-fu and

[20] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, W22:1. (mimeo.) Sept. 2, 1927.

[21] U. S. Dept. Commerce Report, 26th yr., 4(52):828. Dec. 24, 1923.

[22] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, W26:1. (mimeo.) Oct. 5, 1927.

[23] Thorpe, Carlyle. A journey to the walnut sections of Europe and Asia. pp. 45, 53. Privately printed, Young and McCallister, Inc., Los Angeles. 1923.

Luhengsien in the Shantung Province, and around Laohokow in the Hupeh Province, other districts are found.[24] Some of these districts are more in the nature of shipping centers for surrounding territory, than of definitely concentrated producing areas.

The Kansu Province (northwest China) has a large walnut production but it is so far in the interior that the crop cannot be transported to the shipping centers by present means of transportation. The likin taxes (a local tax collected on commodities moving from one province or even from one district to another) is an additional obstruction to the movement of walnuts. These same difficulties are encountered to a greater or less degree in many parts of China.

An American exporting firm in Tientsin[25] has estimated the production of walnuts for the important commercial provinces as follows:

Chihli	2,000 tons
Shansi	3,000 tons
Honan	3,200 tons
Shantung	500 tons

In some cases these figures are merely guesses based on trade information received from dealers.

The total production of walnuts in China can be estimated only in a very rough way, because production figures are non-existent and even the most general knowledge of many interior parts is lacking. Thorpe has estimated "the quantity of walnuts produced in sections of China available for international trade" as between 15,000 and 17,500 tons.[26]

The Maritime Customs records show that for the years 1921 to 1925 the average shipments of walnuts in terms of whole nuts from ports of China to other ports in China and to foreign countries averaged about 11,500 tons,[27] 65 per cent of which enters the shelled trade. About 70 per cent of the commercial crop is exported to foreign countries. The actual crop is undoubtedly very much larger. The quantity entering the trade depends, to a considerable extent, upon the efforts of the dealers in getting the nuts out of the interior.

Our lack of knowledge regarding the total crop of China leaves us in the dark as to its future commercial possibilities. It is fairly

[24] California Fr. News, 67(1804):4. Feb. 24, 1923.

[25] U. S. Dept. of Commerce Report, 25th yr., 2(19):343–344. May 8, 1922.

[26] Thorpe, Carlyle. A journey to the walnut sections of Europe and Asia. pp. 45, 53. Privately printed, Young and McCallister, Inc., Los Angeles. 1923.

[27] On the assumption that 30 pounds of shelled equal 100 pounds of unshelled walnuts. This is the estimate of the Tientsin exporters. (U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, W26:4. (mimeo.) Oct. 5, 1927.)

certain that plantings have not greatly increased in recent years. Thorpe estimated the average age of walnut trees in Shansi at 75 years and said most trees in Tang Shan Valley were from 100 to 200 years old. The Chinese Government (since becoming a republic) has discontinued the practice of subsidizing the planting of trees and most Chinese farmers are too poor to make investments for future generations. Walnut plantings are not taking place, in spite of the fact that the walnut crop is one of the most profitable crops.

Yet without greatly increasing plantings, China's exports of walnuts rose from insignificance to one of great importance in a few years. A part of the walnut-producing area was opened up to world commerce, but that it is so far only a part is generally admitted.[28] If railroad transportation should take the place of coolie porters, the likin taxes be discontinued, cultural methods improved, political order established, and the industry given general encouragement, largely increased quantities might enter the market.

Czechoslovakia.—Information concerning production of walnuts in Czechoslovakia is very meager. Such estimates as there are seem too high. Czechoslovakia is not an important exporting country. In fact, it is reported as one of the main markets for the Roumanian crop.[29] Batchelor reports that the estimate of the Czechoslovakia crop are based on the weight of uncured nuts as soon as they are husked. The cured nuts weigh about one-third less. Most of the crop is sold uncured to the merchants of the neighboring villages.[30] An estimate of 10,000 tons is probably not far from normal.

Spain.—The total production of walnuts in Spain has been placed at 41,000 tons,[31] but this seems to be much too high. Thorpe estimated Spain's production at from 5,000 to 6,000 tons. Spain's total exports of walnuts average about 1,200 tons,[32] most of which are shelled nuts. Assuming they were all shelled nuts, this would amount to only 2,850 tons of unshelled nuts. Since the walnut industry is almost entirely in the hands of small producers home consumption may be rather large.

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[28] California Fr. News, **67**(1804):4. Feb. 24, 1923. U. S. Dept. of Commerce Report, 25th yr., **2**(19):343–344. May 8, 1922.

[29] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, **W1**:1. (mimeo.) Feb. 26, 1925. *Ibid.*, **W22**:1–3. Sept. 2, 1927.

[30] Batchelor, L. D. Walnut culture in Czechoslovakia. Diamond Walnut News, 9(4):7. 1927.

[31] U. S. Dept. Commerce Report, 23rd yr., 1(55):1319. Mar. 6, 1920.

[32] Computed from export figures of years 1913, 1916, 1917, 1920, 1921, as given in U. S. Dept. Agr. Bur. Agr. Econ. Foreign Crops and Markets, **6**(4):51. Jan. 24, 1923; and in U. S. Dept. Commerce Report, 23rd yr., 1(55):1319. Mar. 6, 1920; and data for 1914 and 1915 from Spain's official statistics, Commercio Exterior.

Asiatic Turkey.—Prior to the war, Asiatic Turkey had about 300,000 walnut trees and produced on the average about 16,500 tons of walnuts, but because of the World War and the unsettled conditions following it, many of the trees have been destroyed and many others completely neglected.[33]

Production in this region will probably increase considerably over recent years if political and economic conditions become stabilized, but it cannot reach its pre-war production for several years.

Jugoslavia.[34]—The United States Department of Commerce reports the walnut crop of Jugoslavia for 1928 at 2,200 tons.[35] We are placing the normal walnut production in this country at 2,000 tons in our estimate of world production. Relatively small quantities are exported.

INTERNATIONAL TRADE IN WALNUTS

Statistics on international trade in walnuts are far from complete and those available are not entirely comparable. Indications are, however, that about half the world's crop of walnuts enters into international trade and that nearly a third of that trade is with the United States.

Official export figures from France, Italy, and China indicating quantities shipped to the principal importing countries are given in tables 17, 18, and 19 (see "Appendix," pp. 51–53). The average total exports for the last five years available are: France, 25,364 tons; Italy, 8,248 tons; and China, 6,559 tons. These figures are not comparable because they are simple sums of unshelled and shelled walnuts. China is the only country for which separate data for shelled and unshelled walnut exports are available. The figures for China may readily be converted to terms of whole nuts. The exports of shelled walnuts from Italy are of little importance. With France, however, the quantity of shelled nuts exported is very large. The figure roughly representative of the yearly walnut exports from France in terms of whole nuts is about 40,000 tons. Compared with this the foreign

[33] U. S. Dept. of Commerce Report, 25th yr., 1(71):378–379. Feb. 13, 1922. Annual Report, 1925 of the California Walnut Growers Association places the production of walnuts in Turkey at 21 million pounds.

[34] Jugoslavia includes what was formerly "(1) the independent kingdom of Serbia; (2) the independent kingdom of Montenegro; (3) Bosnia and Herzegovina, annexed by Austria in 1908; (4) Dalmatia, with parts of Styria, Carniola, and Carinthia, belonging to Austria; (5) Croatia, an autonomous province of Hungary; (6) Voivodina (parts of Baranja, Batcka and Banot), belonging to Hungary." Near East Yearbook, 1927:1.

[35] Foodstuffs 'round the world. Conf. Foreign Trade News, p. 5, Oct. 5, 1928.

walnut trade of Roumania is around 15,000,[36] of Italy 8,750 tons,[37] of China 8,000 tons, and of Spain 2,850 tons.[38]

Changes in Foreign Trade since Pre-War Years.—The fact that walnut exports from most foreign countries are not separately classified into shelled and unshelled detracts greatly from the value of the data. Nevertheless, the data indicate in a rough way the extent to which the walnut export trade has increased or shifted since pre-war years.

The 1921–1925 average exports from France of about 25,500 tons is an increase of 15.5 per cent over the 1910–1914 average of 22,000 tons (see table 19, p. 53). The exports to the United States almost doubled between these periods. Netherlands, Sweden, Norway, and Canada are the only other countries that show a corresponding increase. These, however, take but a small part of the exports from France. The significant shift during the past fifteen years in French export trade has thus been increased shipments to United States. This increase is about equal to the increase in total exports from France, so that exports to all other countries, though showing no decrease in the absolute quantity, have decreased relative to the total exports. Great Britain received slightly more nuts though a slightly lower percentage. Germany, on the other hand, received fewer both absolutely and relatively.

The average exports of walnuts from Italy for 1910–1914 amounted to nearly 5,000 tons; for 1922–1926 they amounted to 8,250 tons—an increase of 65 per cent between the two periods. During this same period exports to the United States almost doubled. They increased from 2,915 to 5,297 tons. Increased exports to the United States absorbed almost three-fourths (72 per cent) of the increase in total exports from Italy. During the first period the United States received 59.3 per cent of the total exports from Italy; during the latter period it received 64.2 per cent (see table 18, p. 52).

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[36] Roumania walnut exports:

1922	6,941 tons	1925	14,093 tons
1923	6,927 tons	1926	18,820 tons
1924	19,699 tons	1927	7,115 tons

(California Frt. News, 77(2074):9. Apr. 7, 1928.)

There are no separate statistics available for shelled and unshelled walnuts. Eight or ten cracking plants are maintained at various cities and considerable quantities of shelled nuts are exported. U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, **W22**:3. (mimeo.) Sept. 2, 1927.

[37] Assuming 5 per cent are exported as shelled walnuts. L. D. Batchelor (Diamond Walnut News, 9(1):7. 1927.) gives 8,500 tons.

[38] See discussion of walnut production in Spain, p. 28.

Unshelled and shelled exports from China are given separately by country of destination in table 17 (p. 53). Unshelled walnut exports from China for 1912–1916 averaged about 3,250 tons. For the period 1921–1925 the average was 3,750 tons, an increase of 15.4 per cent over the earlier period. For the same period the average exports of shelled walnuts increased from 250 to 1,800 tons, an increase of 620 per cent. Expressed in terms of whole walnuts, total exports from China increased from 3,900 to 7,750 tons, an increase of 95.9 per cent. As in the case with Italy and France, most of the increase in walnuts exported from China has gone to the United States.

Exports by country from the other walnut-producing regions are not available. Analysis of the United States walnut imports by countries, however, indicated that there has been no increase in exports to the United States from other foreign countries comparable to the increases from France, Italy, and China.

Tables 17 and 18 show that the United States is by far the largest importer of walnuts from China and Italy. England leads the United States as an importer of French walnuts on the basis of the French export statistics. However, it should be noted that these statistics do not separate shelled from unshelled, so that comparison in terms of whole walnuts is impossible. A very large part of the United States imports are shelled, and it is quite possible that on the unshelled basis the United States imports a larger proportion of the French crop than Great Britain. The United States really gets a larger portion of the crop from these countries than these tables indicate, for some of the walnuts exported to other countries eventually reach the United States. For example, the United States imports walnuts from England and Japan. These countries are themselves importers, rather than commercial producers of walnuts. Moreover, in some cases larger quantities of walnuts are imported from the producing countries, according to United States import figures, than the export statistics of the respective countries indicate. The following figures are averages for five years, 1921–1925, and include both shelled and unshelled walnuts.

	France	Italy	China
	tons	*tons*	*tons*
Quantity imported to United States (U. S. import statistics)	10,809	5,550	3,273
Quantity exported to United States (According to statistics of foreign country)	8,120	5,297	3,199
Difference	2,689	253	74
Difference expressed in percentage of United States import quantities	24.9	4.6	2.3

The principal markets for Roumania's walnut crop are the neighboring countries. The largest and steadiest demand comes from Poland and Hungary, although Austria and Czechoslovakia also import quantities.[39] During the past few years the United States has imported, on the average, about 750 tons of unshelled walnuts from Roumania.

The demand for walnuts by Germany appears to be back to about its pre-war status, as indicated by French exports to Germany (see table 19, p. 53).

APPROXIMATE WORLD PRODUCTION, CONSUMPTION, AND EXPORT OF WALNUTS BY COUNTRIES

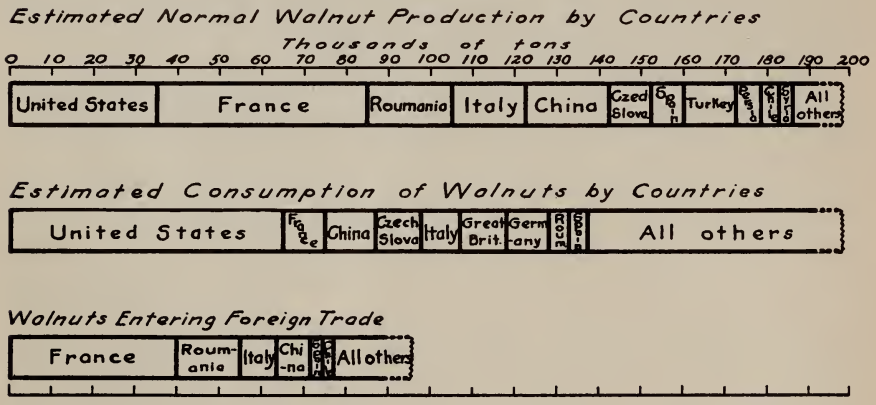

Fig. 8.—The United States is by far the most important buyer of walnuts.

Summary on International Trade.—Figures thus far presented on foreign production and on international trade are in a considerable measure fragmentary. It seems desirable, however, to piece together, even though it be roughly, the available parts of the picture in an attempt to get a glimpse of the whole. This is done in table 10 and figure 8. The mere fact that decimal figures have been used should not be taken as an evidence of accuracy. In a few cases the figures are admittedly estimates on the part of the authors, based on general statements gleaned from reading on the subject or on conflicting estimates of others.

[39] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, **W22**:2. (mimeo.) Sept. 2, 1927.

TABLE 10

ESTIMATED PRODUCTION, CONSUMPTION, AND EXPORTS OF WALNUTS FROM VARIOUS COUNTRIES IN TERMS OF WHOLE WALNUTS*

	Estimated normal production of walnuts	Estimated consumption of walnuts	Walnuts entering foreign commerce
	1	2	3
	1000 tons	*1000 tons*	*1000 tons*
United States	35[1]	65[2]	.....
France	50[3]	10[4]	40[5]
Roumania	20[6]	5[4]	15[7]
Italy	17.5[8]	8.7[4]	8.8[9]
China	20[10]	12[4]	8[9]
Czechoslovakia	10[11]	11[11]	.....
Spain	7.5[12]	4.7[4]	2.8[12]
Turkey	12.5[13]	.....[14]	.....[14]
Persia	6[15]	.....[14]	.....[14]
Chile	4[16]	1.3[16]	2 7[16]
Syria	3[17]	.....[14]	.....[14]
Jugoslavia	2[18]	.....[14]	.....
Greece	2[19]	2[19]	.....
Great Britain	.....	11[20]	.....
Germany	.....	10[20]	.....
Other countries	3[21]	51.8[21]	6.0[21]
Total	192.5	192.5	83.3

* The figures for some countries doubtless are in error and others are merely the roughest sort of estimates. The estimates of the production of these countries as made by various agencies in many cases show wide discrepancies. They are here given only as a very rough picture of the world situation.

[1] Estimated normal for 1928.

[2] See table 13, page 44.

[3] Association estimated 45,100 tons "available for export." See page 23. Total is probably larger.

[4] Obtained by subtracting the walnut exports of these countries from their estimated production.

[5] See page 29.

[6] Association estimated 1928 normal at 9,900 tons "available for export."

[7] Approximate normal based on inspection of exports, 1922–1927. See p. 30.

[8] Association estimated 9,600 tons "available for export." Doubtless large amount consumed at home. See pp. 24–25.

[9] See p. 30.

[10] Thorpe estimated in 1922 a total production of from 15,000 to 17,500 tons "available for international trade." Thorpe, C. A journey to the walnut sections of Europe and Asia, p. **53**, 1923.

[11] See pp. 28.

[12] See p. 28.

[13] See p. 29. Improved conditions believed to warrant an increase in "normal."

[14] Included in "other countries."

[15] Foodstuffs "Round the World, Confec. Foreign Trade News, Dec. 10, 1926, *p.* **6**.

[16] Foodstuffs 'Round the World, Confec. Foreign Trade News, Jan. 28, 1927, *p.* **4**; Apr. 22, 1927, *p.* **4**. Figure for 1925 on exports. Authors' estimate of production.

[17] *Ibid.*, June 6, 1927, *p.* **4**.

[18] Foodstuffs 'Round the World, Confec. Foreign Trade News, Oct. 5, 1928, *p.* **5**.

[19] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts *N* **10**: 2. (*mimeo.*). July 29, 1926.

[20] Authors' estimate based on import and export data of various countries.

[21] Authors' allowance for countries on which adequate data are not available. This includes countries for which production data are given in column 1 and other countries not here listed.

TABLE 11

IMPORT OF WALNUTS INTO UNITED STATES, 1900–1927

Year	Unshelled	Shelled	Shelled in terms of whole nuts	Total in terms of whole nuts
	tons	*tons*	*tons*	*tons*
1902–03 to 1906–07	8,277	2,294	5,462	13,739
1912–13 to 1916–17	11,605	5,838	13,894	25,504
1922–23 to 1926–27	11,631	10,397	24,756	36,387
1900–01	4,851	1,112	2,472	7,323
1901–02	5,197	1,297	2,883	8,080
1902–03	4,468	1,518	3,373	7,841
1903–04	9,727	1,740	3,867	13,594
1904–05	8,156	2,089	4,642	12,798
1905–06	7,515	2,474	5,498	12,513
1906–07	11,518	3,600	8,000	19,518
1907–08	10,714	3,549	7,888	18,602
1908–09	8,716	4,391	9,758	18,474
1909–10	11,635	5,480	12,179	23,814
1910–11	10,573	5,622	12,493	23,066
1911–12	11,104	5,357	11,904	23,008
1912–13	9,468	5,246	11,659	21,127
1913–14	13,429	4,379	9,732	23,160
1914–15	10,543	5,830	12,956	23,499
1915–16	11,798	7,350	16,333	28,131
1916–17	12,788	6,382	14,183	26,971
1917–18	5,561	5,553	12,340	17,901
1918–19	3,278	4,120	9,155	12,433
1919–20	12,223	8,737	19,416	31,639
1920–21	8,712	4,891	10,870	19,582
1921–22	19,358	8,543	18,984	38,342
1922–23	9,545	8,965	19,922	29,467
1923–24	9,615	9,645	21,328	30,991
1924–25	15,244	11,683	25,961	41,205
1925–26	11,392	11,568	25,707	37,099
1926–27	12,095	10,440	22,609	34,970
1927–28	4,944	7,936	17,805	22,749
	Per Cent Increase			
	per cent	*per cent*	*per cent*	*per cent*
1903–07 to 1913–17	42.2	154.5	.....	85.6
1913–17 to 1923–27	0.2	78.1	.....	42.7

Sources of data: Cols. 1 and 2. Import data for years 1900–1912 are imports entered for consumption as given in Commerce and Navigation of the United States for various years. For years 1913–1926 the data were compiled from Monthly Summaries of Foreign Commerce of the United States and are for general imports. The difference between imports entered for consumption and general imports is explained by the following statement taken from Commerce and Navigation of the United States:

> "The statement of *imports entered for consumption* . . . . embraces imported articles entered for immediate consumption and imported articles withdrawn from warehouse for consumption. The statement of *general imports* and the statement of *imports entered for consumption* for any period will always differ to the extent that the value of *entries for warehouse* for the period differs from the value of *withdrawals from warehouse for consumption*." (Foreign Commerce and Navigation of the United States, 1: *v.* 1926.)

Prior to July, 1912, the data for general imports of shelled and unshelled walnuts were not published separately. As the imports entered for consumption are given in yearly figures only, it was not possible to put imports for 1901–1912 on a crop-sales year basis. However, the difference between the imports by fiscal year and by crop-sales year is usually of minor importance, as the amount imported in July, August and September is relatively small. Data for 1927 from Weekly issues of California Fruit News,

76-77 (2034–2111): July, 1927–Dec., 1928.

(Continued on page 35)

IMPORTS OF WALNUTS INTO THE UNITED STATES

In this bulletin the import and consumption data have been given, wherever possible, by crop-sales years, running from October to September, inclusively, instead of by calendar or fiscal years. Where this was not possible the fiscal years have been used. The data on the latter basis do not vary greatly from the crop-sales year data because imports during July, August, and September are not great. The crop-sales years are designated by compound numerals, i.e., 1925–26, 1926–27, etc., the first numeral representing the three months of the year in which the crop matures. Thus the California crop harvested in the fall of 1926 is the crop included in the 1926–27 crop-sales year.

Stated in terms of merchantable whole walnuts, the imports of walnuts for the years 1913–14 to 1916–17 provided 67.2 per cent of the United States consumption as compared with 53.6 per cent for the years 1925–26 to 1927–28. For the last complete crop-sales year, 1927–28, the percentage fell abruptly to 33.2 per cent, and for the first four months of the 1928–29 crop-sales year for which import figures are available at this date the imports of shelled are but 76.9 per cent of the previous year's imports to the same date, while unshelled are 154 per cent of the previous comparable figure.

Unshelled Walnut Imports.—The quantity of unshelled walnuts imported fluctuates greatly from year to year. In the closing months of 1918 there was a scarcity of ships to transport walnuts from Europe, hence imports of walnuts fell to a low point during the crop year 1918. From 1919 to 1922 walnut imports were very erratic. It might be expected that fluctuations in the quantity of unshelled walnuts imported would be caused by variations in California production, and the high and low prices that would accompany small and large California crops respectively. Such a tendency has not been noticeable until the last four years. In these years imports of whole nuts have been large when our crops were relatively short and vice versa. This relationship may be expected to continue. It may also be expected that if California production increases and prices work to lower levels foreign demand will absorb increasing percentages of the foreign crop, particularly if European purchasing power were

Col. 3 was obtained by converting data of col. 2 into terms of whole walnuts by assuming that 100 pounds of merchantable walnuts contain 45 pounds of nut kernels. The actual figure will, of course, vary widely from variety to variety, from country to country, and for walnuts of varying qualities. Conversion factors occasionally used vary from 0.30 used by exporters in China (U. S. Dept. Agr. Bur. of Agr. Econ. For. News on Nuts, W 26: (*mimeo.*) 4 Oct. 5, 1927 to the figure 0.45 used by the present authors and by L. D. Batchelor, of the California Citrus Experiment Station (California Exp. Sta. Bul. 379). Anyone desiring to use a different base in any specified instance can reconvert to unshelled by multiplying by 0.45 and then dividing by the chosen factor—say 0.42.

to improve. Other factors, such as the world production and demand, may greatly modify the expected effect of the size of the California crop.

During the first ten years of the century the imports of unshelled walnuts increased considerably (table 11). Since then marked fluctuations, with no apparent trend, have been characteristic of imports. Relative to California production and United States population, the importation of unshelled walnuts has decreased during this period.

Shelled Walnut Imports.—With the exception of a few years during the latter part of, and following, the war, the shelled walnut imports of the United States have shown in general a rather steady increase. The average shelled walnut imports for the five-year periods 1910–1914 and 1923–1927 are 5,217 tons and 10,398 tons, respectively, showing an increase of 99.3 per cent between the two periods. A slight decline occurred during 1912, 1913, and 1914, and a more severe decline has taken place during 1926, 1927, and 1928 (see fig. 9).

Seasonal Distribution of Imports.—The first important foreign shipments of unshelled walnuts from the new crop come to the United States from southern Italy. Shipments of the Sorrento walnuts from Naples begin during the last two weeks of September, the bulk being exported during October.[40] Shipments from France start during the latter part of October, but November is the great exporting month.[41] The bulk of the unshelled walnuts from China are exported during October.[42] Exportation from Roumania begins about the middle of October.

As transportation across the ocean takes considerable time, the months of the largest imports into the United States do not correspond exactly with the months of greatest exportation from the supplying countries. Figure 10 shows recent United States imports of unshelled walnuts by months for France, Italy, and China. Large quantities of unshelled walnuts are regularly imported during the first three months of the crop-sales year (last three months of the calendar year). Figure 11 shows the average imports by months for the five-year period, October, 1922, to September, 1927. The figure illustrates in a general way the distribution of unshelled walnut imports back to 1913, which is as far back as data are available. During these five crop-sales years 52 per cent of the total unshelled

[40] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, **W10**:1. (mimeo.) Sept. 21, 1926.

[41] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, **W15**:1. (mimeo.) May 10, 1927.

[42] U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, **W26**:3. (mimeo.) Oct. 5, 1927.

imports have arrived during November and 79 per cent have arrived during the three-month period of October, November, and December. France, Italy, and China furnish about four-fifths of the unshelled walnut imports.

Imports of Unshelled and Shelled Walnuts, Years Beginning in July from 1900 to 1911, and in October from 1912 to 1927

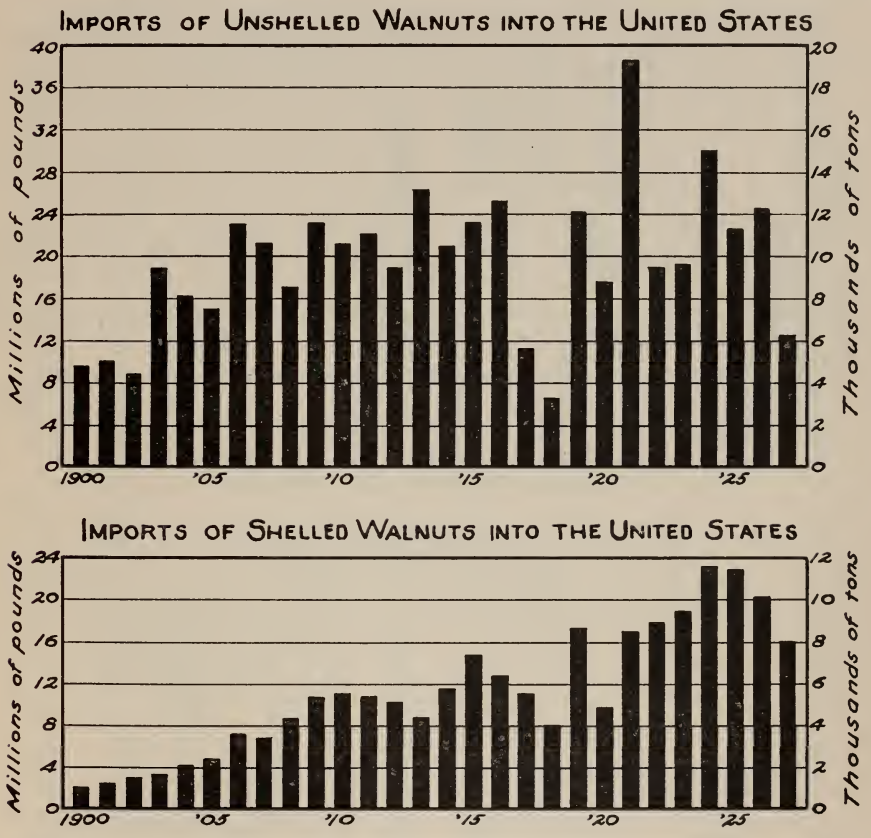

Fig. 9.—Imports of unshelled walnuts have fluctuated more widely from year to year than have imports of shelled walnuts. No continuous trend is apparent in either case.

The seasonal distribution of shelled walnut imports is very different from that of unshelled walnuts. Figure 12, showing the seasonal distribution of shelled walnut imports from France and China, which furnish about four-fifths of the shelled walnut imports, indicates that no one month is outstanding in every year. The peak of shelled imports usually occurs in March, but it may occur in any of the first four months of the calendar year (see table 21). Figure 11

shows that imports of shelled walnuts are about equal for February, March, and April. During the five-year period, October, 1922, to September, 1927, 17 per cent of the shelled imports arrived in February, 17 per cent in March, 15 per cent in April. Thus about half of the total shelled imports came in these three months, while about three-fourths (72 per cent) arrived during the first five months of the calendar year.

MONTHLY IMPORTS OF UNSHELLED WALNUTS INTO THE UNITED STATES FROM FRANCE, CHINA, AND ITALY FOR FOUR YEARS

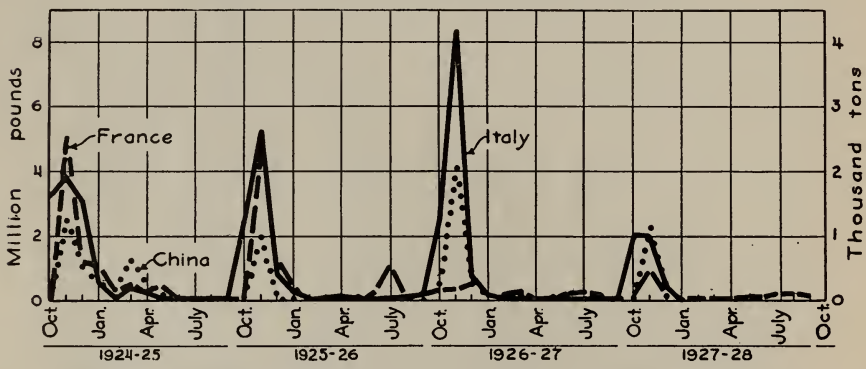

Fig. 10.—Unshelled walnut imports arrive in greatest volume in October, November, and December.

TABLE 12

WALNUT IMPORTS BY MONTHS

Averages for five-year period, October, 1922, to September, 1927

Month	Unshelled	Shelled	Shelled in terms of whole nuts	Total in terms of whole nuts
	1	2	3	4
	tons	*tons*	*tons*	*tons*
October	1,251	475	1,056	2,306
November	6,008	463	1,028	7,035
December	1,936	795	1,766	3,701
January	494	1,334	2,965	3,459
February	195	1,751	3,891	4,086
March	434	1,761	3,912	4,346
April	231	1,514	3,364	3,595
May	345	1,097	2,437	2,781
June	246	680	1,511	1,757
July	285	235	521	806
August	113	79	175	288
September	105	217	481	586
Year	11,643	10,401	23,107	34,746

Sources of data: Col. 1 and 2 computed from data given in Monthly Summaries of Foreign Commerce of the United States. Col. 3 obtained by converting data of col. 2 into whole nuts on the assumption that 100 pounds of whole nuts produce 45 pounds of shelled nuts. See footnote to table 11. Col. 4 is the sum of the data of col. 1 and col. 3.

Walnut Imports by Months, October, 1922, to September, 1927

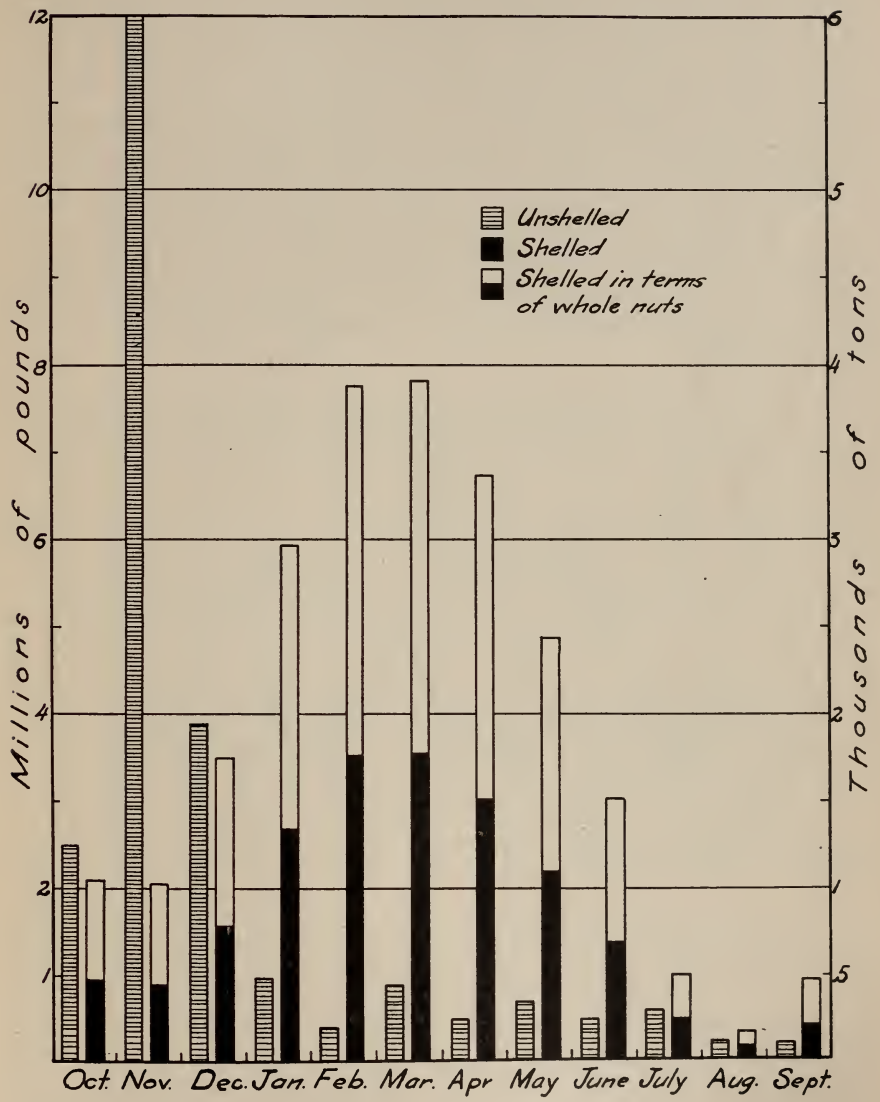

Fig. 11.—The heaviest imports of unshelled walnuts come in November, whereas shelled walnuts are imported in greatest volume during the first four months of the calendar year.

UNITED STATES WALNUT IMPORTS BY COUNTRIES OF ORIGIN

Unshelled Walnuts.—Italy, France, and China furnish the United States with most of the unshelled walnuts which it imports. During the five calendar years 1923–1927, these countries have supplied 87.1 per cent of the total quantity imported, while during the fiscal years from 1913 to 1917 they furnished 86.3 per cent.[43] Though the proportion of the imports furnished by these countries as a group has remained nearly the same, the percentage imported from each has undergone consideraly change. Formerly France furnished the largest part, but during the past decade France and Italy have exchanged places in importance. The proportion supplied by France decreased from 42.5 per cent in the early period to 25.1 per cent in the latter period, while that supplied by Italy increased from 27.6 per cent to 44.3 per cent.

IMPORTS OF SHELLED WALNUTS FROM FRANCE AND CHINA BY MONTHS, OCTOBER, 1924, TO SEPTEMBER, 1928

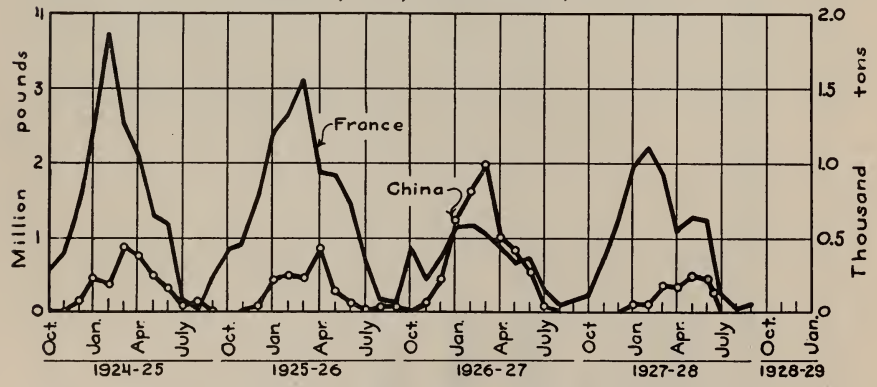

Fig. 12.—Shelled walnuts are imported in greatest volume after the first of the year. France and China are the heaviest exporters to the United States.

The imports from Japan for the most part are walnuts shipped there from China. Those from England are re-exports from other European countries. Roumania sometimes exports some walnuts to the United States, but usually the Roumanian crop is absorbed by the European trade, through which, perhaps, some of the crop eventually reaches the United States. Greece, Portugal, Turkey, Bulgaria, and some other countries at times furnish walnuts to the United States trade. Canada is sometimes mentioned as an importer. Its imports are through the port of Vancouver, and doubtless are Chinese nuts.

Shelled Walnuts.—France has always been the most important source of imported shelled walnuts. The amount supplied by France

[43] Unpublished tables compiled by authors.

has shown a general increase up to the past two years. A decrease in 1927 is largely attributable to a short 1926 crop in France. The percentage of the total shelled imports furnished by France shows, nevertheless, a slight decline. China, our other important source of shelled walnuts, has increased in importance during the past fifteen years. China at times appears to fill up a shortage in the French supply. This is very noticeable in 1927 and to a less degree in 1919. During the past five years France has supplied 69.8 per cent, China 17.2 per cent, and Spain 3.5 per cent of the total shelled import.[44]

Tariff Rates on Walnuts in Percentage of Import Values

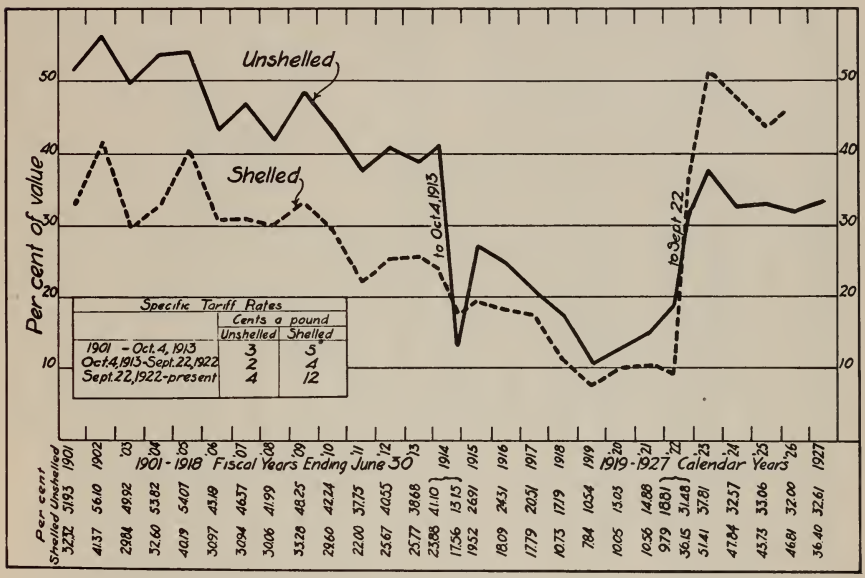

Fig. 13.—This chart pictures the tariff rates as related to value of walnuts imported. The tariff act of 1922 gave shelled walnuts a greater relative increase in protection than unshelled.

The data for figure 13 were compiled from Foreign Commerce and Navigation of the United States, 1901–1926, and for 1927, from the monthly summary of Foreign Commerce of the United States, December, 1927. The percentages were obtained by dividing the total duty paid by the total import value of the walnuts. This is equivalent to dividing the specific tariff rate per pound by the import value. The value of imported merchandise "represents, up to and including May, 1921, the actual market value or wholesale price thereof at the time of exportation to the United States, in the principal markets of the country from whence exported, including the value of containers, or coverings, ... and all other costs, charges, and expenses incident to placing the merchandise in condition, packed ready for shipment to the United States. . . . . Beginning with June, 1921, the import value represents either the actual foreign market value as defined above or 'the export value, including any tax imposed by the country of exportation,' . . . . whichever value is higher." The Tariff Act of 1922 defined the import value "as the foreign value or the export value, whichever is higher. If neither of these can be ascertained, then the United States value, or if none of the foregoing values can be ascertained, then the cost of production. If there be any similar competitive article manufactured or produced in the United States of a class or kind upon which the President has made public a finding as provided for, then the American selling price."

[44] Unpublished tables compiled by the authors. The above percentages are on a fiscal-year basis for the earlier periods and a calendar-year basis in recent years. Crop-sales year data by countries are available only for recent years. If figured on a crop-sales year basis the results are but slightly different.

TARIFF

The tariff on walnuts, no doubt, is one of the factors affecting the quantity of walnuts imported into the United States, but its effects are largely obscured by more powerful forces. The tariff act which became effective October 4, 1913, reduced the rate on unshelled walnuts from 3 cents to 2 cents a pound and the rate on shelled walnuts from 5 cents a pound to 4 cents. The tariff act effective September 22, 1922, raised these rates to 4 cents a pound for unshelled and 12 cents a pound for shelled walnuts. This rate has continued to the present time.

The year following the enactment of the tariff of 1913 showed an increase in imports of unshelled walnuts, but a decrease in shelled walnut imports. The smallest quantity of unshelled walnuts imported during any crop-sales year of this century was in 1918–19 when the tariff rate was only 2 cents a pound. Curtailed shipping facilities late in 1918 were doubtless the explanation. The year following the enactment of the tariff act of 1922 showed a marked decrease of unshelled walnut imports, but even this decreased amount was larger than imports in 1920–21. Moreover, imports of shelled walnuts increased slightly in spite of the fact that this tariff is especially heavy on shelled walnuts. Furthermore, the imports of walnuts were considerably less in 1921 than in 1923 (table 11). Hence the decrease in imports of unshelled walnuts in 1922–23 cannot be attributed entirely to the tariff.

WALNUT CONSUMPTION IN THE UNITED STATES

The consumption of walnuts in the United States has increased more rapidly than the population. The per-capita consumption in terms of merchantable whole walnuts has increased from perhaps ⅓ pound at the beginning of the century to about 1½ pounds at present. However, consumption fluctuates rather widely from year to year. In the crop-sales year of 1919–20 there was rather an abrupt increase in the consumption, which has been maintained except for 1920–21 and 1926–27. In table 13 an attempt has been made to compute consumption for crop years from 1913–14 to 1928–29. Data on domestic shelled-walnut production are lacking prior to 1922 but would not make an appreciable difference in the consumption figures of the last column.

Apparent Per-Capita Consumption of Walnuts in the United States, 1913–14 to 1927–28

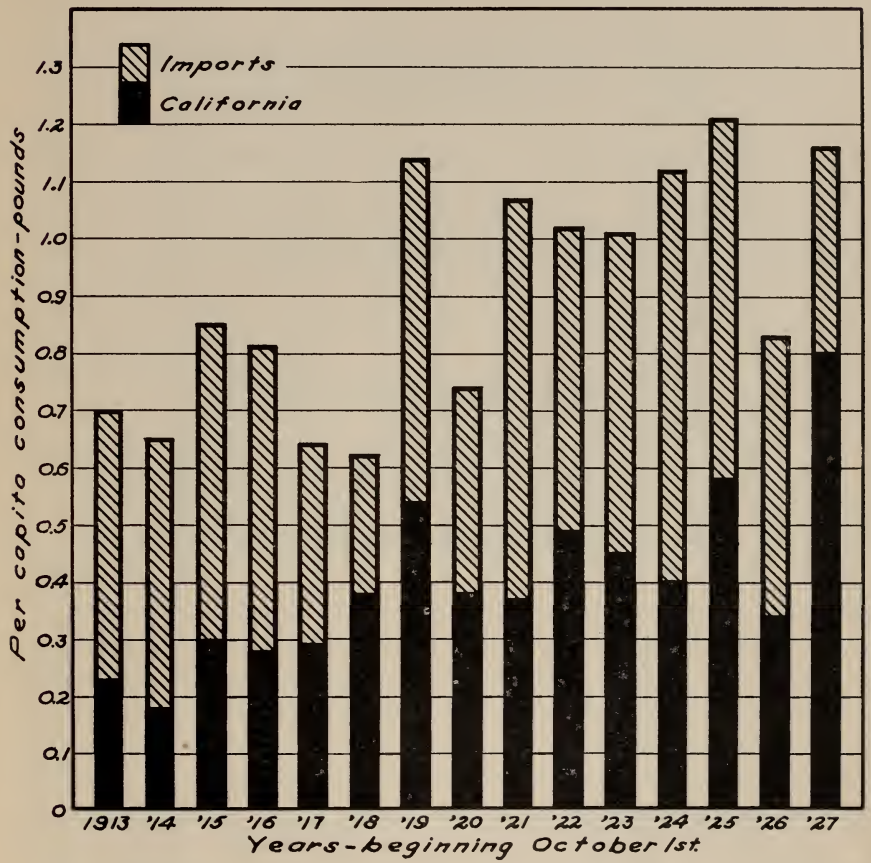

Fig. 14.—Walnut consumption has increased considerably since the War.

Shelled-walnut imports furnish a good index to the consumption of shelled walnuts, since most of those consumed in the United States are imported. It is estimated that only from 10 to 15 per cent of the domestic production is shelled. Figure 9 (p. 37) indicates that there has been a great increase in shelled-walnut imports during the past quarter of a century, although the imports have decreased after 1924–25. Whether imports continue to decrease as domestic production of nut meats increases remains to be seen.

TABLE 13

PRODUCTION, IMPORTS, AND APPARENT UNITED STATES PER-CAPITA CONSUMPTION OF WALNUTS IN EQUIVALENT OF MERCHANTABLE WHOLE NUTS, 1913–14 TO 1928–29

Year beginning October 1	California production of merchantable walnuts	California production of walnut kernels		Production in Oregon‡	Imports in terms of merchantable whole walnuts§	Apparent consumption in terms of merchantable whole walnuts¶	United States population January 1 following harvest (000 omitted)	Per-capita consumption
		Meats*	Equivalent in merchantable walnuts†					
	tons	*tons*	*tons*	*tons*	*tons*	*tons*		*pounds*
1913–14	11,189			114	23,160	34,463	98,213	0.70
1914–15	8,889			90	23,499	32,478	99,710	0.65
1915–16	14,817			150	28,131	43,098	101,055	0.85
1916–17	14,340			148	26,971	41,459	102,590	0.81
1917–18	15,123			183	17,901	33,207	103,852	0.64
1918–19	19,857			203	12,433	32,493	104,524	0.62
1919–20	28,448			237	31,638	60,323	105,711	1.14
1920–21	19,997			214	19,582	39,793	107,412	0.74
1921–22	20,068			204	38,342	58,614	109,135	1.07
1922–23	25,011	854	1,898	275	29,467	56,651	110,688	1.02
1923–24	24,405	444	987	255	30,991	56,638	112,684	1.01
1924–25	21,405	637	1,416	230	41,205	64,256	114,553	1.12
1925–26	28,874	1,917	4,260	367	37,099	70,600	116,257	1.21
1926–27	11,740	874	1,942	480	34,969	49,131	117,882	0.83
1927–28	41,750	2,450	5,444	770	22,748	70,712	119,320	1.18
1928–29	21,061	1,910	4,244	1,000			120,758	

* Production of meats available 1922–1928 only. From 1922 to 1928 the production of meats was equal to 3 to 6 per cent of California production of merchantable nuts. Prior to 1922 the percentage shelled was probably less than in the period 1922–1928.

† Converted to equivalent of merchantable nuts by dividing by 0.45.

‡ Figures 1926–1928 are estimates by North Pacific Nut Growers Cooperative. Earlier figures estimated by L. D. Batchelor.

§ From table 11.

¶ No account is taken of production in other parts of the United States. However, the small amount there produced is probably offset by exports from the United States. Neither is account taken of carryovers from one year to another.

PRICES OF CALIFORNIA WALNUTS

When one wishes to compare prices of one period with those of another, some price quotation is necessary which continues throughout the period without great change in meaning and which fairly represents price changes from time to time in the industry as a whole. In the California walnut industry the series of prices which comes nearest meeting these requirements is the opening price announced by the organized producers as given in column 2 of table 14.

Since 1912 these prices have been announced by the California Walnut Growers Association. For some years prior to that, prices were named by a committee representing a small group of growers' associations. The opening price statement, of course, included other than No. 1 Soft-Shell walnuts. Other prices consistently quoted are given in table 23 (p. 59).

Relation of Opening Price to Growers' Prices.—In recent years the returns made to local associations by the California Walnut Growers Association have varied from 95.0 per cent to 91.5 per cent of values based on opening prices. The deductions in percentage of opening-price values as reported to the local association are set forth in table 15.

Local associations in turn make deductions to cover operating expenses. These amount to nearly 2 cents a pound, but vary widely from association to association and from year to year. A deduction of 2 cents a pound would mean a deduction of 10 per cent when the opening price is 20 cents, and 8 per cent when the opening price is 25 cents. Opening prices are therefore never an indication of what the grower gets in a given year but do show roughly changes from year to year.

Opening Price and Purchasing Power.—Any discussion of prices for a time extending back to or through the war period must consider changes in the general level of prices. It is usual to express such changes as increases or decreases in the purchasing power of the dollar. Such changes are commonly summed up in a figure known as an index of wholesale prices of all commodities. There are a number of such indexes but perhaps the most widely used is that of the Bureau of Labor Statistics.[45] Column 4 of table 14 gives this index for the months of October to December of each year, all expressed as a percentage of the 1910 to 1914 average.

[45] Published regularly in Monthly Labor Review of the Bureau of Labor Statistics, U. S. Dept. of Commerce.

TABLE 14

OPENING PRICES AND PURCHASING POWER OF CALIFORNIA NO. 1 SOFT-SHELL WALNUTS, 1898–1927

Year	Date of naming opening prices	Opening price, cents per pound	Relative price, per cent of 1910–1914 average	Oct.-Dec. average all-commodity wholesale price index	Purchasing power	
					Per pound, cents	Per cent of 1910–1914 average
	1	2	3	4	5	6
Av. 1910–1914		15.1	100	100	15.1	100
1898	August 8	7.0	46.4	73	9.6	63.6
1899	September 23	8.75	57.9	79	11.1	73.5
1900	September 15	10	66.2	81	12.3	81.4
1901	September 21	9.5	62.9	83	11.4	75.5
1902	September 13	10.	66.2	91	10.9	72.2
1903	September 16	12.5	82.8	86	14.5	96.0
1904	September 24	11	72.8	89	12.3	81.4
1905	September 23	13	86.1	88	14.7	97.3
1906	September 8	11	72.8	93	11.8	78.1
1907	September 21	15	99.3	95	15.7	104.0
1908	September 15	12.5	82.8	94	13.2	87.4
1909	September 26	11.5	76.2	104	11.0	72.8
1910	September 26	15	99.3	98	15.3	101.3
1911	September 30	14	92.7	96	14.5	96.0
1912	October 5	14	92.7	102	13.8	91.4
1913	October 4	16	106.0	102	15.7	104.0
1914	September 24	16.5	109.3	99	16.7	110.6
1915	October 2	13.6	90.1	107	12.7	84.1
1916	September 30	15.5	102 7	146	10.6	70.2
1917	October 2	20.1	133.1	186	10.8	71.5
1918	October 1	28	185.4	206	13.6	90.1
1919	October 1	31.5	208.6	220	14.3	94.7
1920	October 8	22.5	149.0	199	11.3	74.8
1921	September 28	24.5*	162.3	143	17.1	113.2
1922	October 3	22. ε	149.0	158	14.2	94.0
1923	October 4	22	145.7	155	14.2	94.0
1924	October 9	25	165.6	157	15.9	105.3
1925	September 30	24	158.9	160	15.0	99.3
1926	October 6	28.0	185.4	151	18.5	122.5
1927	October 5	21	139.1	152	13.8	91.4
1928		26	172.2	152	17.1	113.2

Sources of data: Col. 2, opening prices as named by the Walnut Association of southern California from 1898 to 1912, were compiled from annual reviews of the walnut industry as published in the annual review numbers of the California Fruit Grower, later the California Fruit News. Opening prices for 1913–1927 are those named by the California Walnut Growers Association and were furnished by them. Also published in California Fruit News.

Col. 3, obtained by dividing the opening price for each year by the 1910–1914 average price.

Col. 4, U. S. Bureau of Labor Statistics all-commodity wholesale price index for the United States, October-December, converted to the base 1910–1914=100. The October-December average was taken because it more nearly represents the price levels obtaining at the time the walnut crop is marketed than would a yearly average. Since monthly index numbers are not available for 1898 and 1899, these were centered at Jan. 1 by averaging the index number of the crop year with that of the next year. Data for period 1898–1927 from: U. S. Dept. Agr. Bur. Agr. Econ. Index numbers of farm prices, *p.* **54** (*mimeo.*) Jan., 1928. Later data from the Agricultural Situation **13** (4): 6. April, 1929. Same publisher.

Col. 5, computed by dividing data of col. 2 by data of col. 4 and multiplying by 100.

Col. 6, obtained by dividing 1910–1914 average of col. 5 into each item in col. 5.

* Opening price of 24.5 is the price quoted on the first allotment. Second allotment made on Oct. 3 at a price of 27 cents (Calif. Fruit News, *p.* **7**. Oct. 8, 1921.) The opening price in this year does not represent the season's average. A price of 25 cents would be more nearly representative. Similar changes in a few other years would be in order.

Nearly everyone has noticed that during and immediately after the war the prices of most commodities were nearly double their pre-war prices. Then in 1920 prices fell abruptly. Now if all prices had gone up together and in the same proportion and there were no long-time contracts everyone would have been as well off at high prices as before and the abrupt fall of 1920 would not have injured anyone.

Comparison of the Opening Prices on No. 1 Soft Shell Walnuts and Purchasing Power at Opening Price, 1898–1928

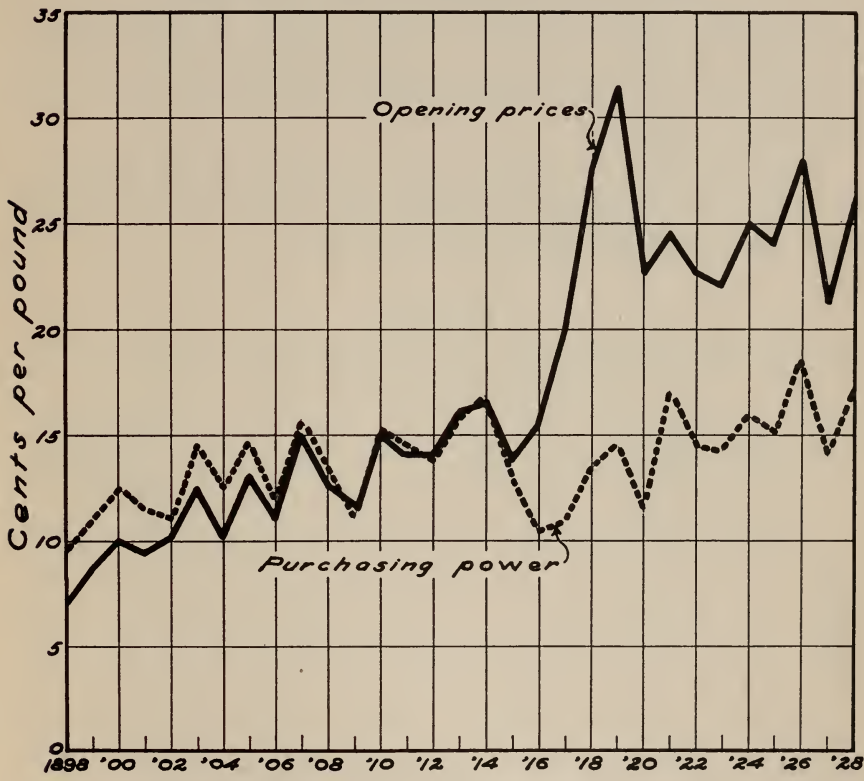

Fig. 15.—There has been a slight upward trend in purchasing power of walnuts throughout most of the period from 1898 to 1928. During the last seven years of the period the purchasing power of walnuts averaged about 7 per cent higher than the purchasing power of farm products as a whole.

If, for example, when walnut prices went from 14 cents in 1912 to 28 cents in 1918, all goods which walnut producers buy had gone up in the same proportion, the walnut producers could have bought as much food, clothing, shelter, etc., with each ton of walnuts as before. As a matter of fact, however, prices do not go up in like proportion nor at the same time, and there *are* long-time contracts. Hence the

producer of any given product is interested in knowing how much of other products his own product will buy from time to time.

In column 5 of table 14 opening prices of walnuts have been converted to a base which makes allowance for changes in the price level so that this column roughly represents prices as they were during the period 1910–1914, inclusive. Column 6 merely represents the same figures in percentage of the average for the same period. The dotted line in figure 15 pictures roughly such a purchasing power for walnut prices. Purchasing power apparently increased somewhat up to the opening of the European War, then fell slightly, and has improved somewhat in the past few years.[46] The purchasing power of walnuts averaged about 7 per cent above that of farm products as a whole from 1922 to 1928.

Wholesale prices to retailers will, of course, be 5 or 6 cents above the opening prices of the association, since they allow for transportation and mechandising expenses and profits.

TABLE 15

DEDUCTIONS FROM OPENING PRICE VALUES AS MADE BY THE CALIFORNIA WALNUT GROWERS ASSOCIATION, 1923–1927

Year	Trade discount	Advertising	Brokerage	General expense	Rebates	Total deductions		Deductions for advertising, brokerage, and expense only	
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*cents per pound**	*per cent*	*cents per pound**
1923	1	2	1½	1	.....	5½	1.23	4½	1.01
1924	1	2¼	1½	¾	.....	5½	1.39	4½	1.14
1925	1	1¾	1½	¾	3½	8½	2.01	4	.96
1926	1	2½	1½	1½	.....	6½	1.83	5½	1.55
1927	1	1¾	1½	1¼	.....	5½	1.38	4½	1.13

Source of data: Annual reports of Manager to Board of Directors of California Walnut Growers Association.

* Compiled from data on opening price values and quantity of merchantable nuts sold. Data as follows:

Year	Pounds	Opening-price values
1923	39,753,800	$8,961,906
1924	34,975,100	8,894,370
1925	48,160,170	11,572,141
1926	18,834,000	5,327,474
1927	34,564,000	8,648,872

[46] For a comparison with purchasing-power figures for other commodities, consult other experiment station bulletins dealing with the economic aspects of given crops or products. See for example: Shear, S. W. Economic aspects of the pear industry. California Agr. Exp. Sta. Bul. 452:37, 38, 89, 90. 1928. Similar publications are available on approximately twenty California crops. A list of publications available may be obtained by writing to the College of Agriculture, Berkeley, California.

APPENDIX OF TABLES

TABLE 16

CALIFORNIA WALNUT ACREAGE BY COUNTIES, 1924–1929
Bearing and Non-bearing

County	Bearing							1929						Total bearing and non-bearing	
	1921		1924	1925	1926	1927	1928	Bearing			Non-bearing				
	acres	*per cent of total*	*acres*	*acres*	*acres*	*acres*	*acres*	*acres*	*per cent of total*	*per cent increase over 1921*	*acres*	*per cent of total*	*per cent of bearing*	*acres*	*per cent of total*
State total	61,781	100	68,572	69,629	71,779	75,307	83,252	87,564	100		39,921	100	45.6	127,485	100
Contra Costa	2,500	4.0	2,500	2,500	2,650	2,686	3,686	3,686	4.2	47.4	1,528	3.8	41.4	5,214	4.1
Lake	90	0.1	507	585	706	813	953	1,000	1.1	111.0	2,600	6.5	26.0	1,260	1.0
Santa Clara	1,100	1.8	2,110	2,110	2,060	2,210	2,310	2,505	2.9	127.7	1,346	3.4	53.7	3,851	3.0
San Joaquin	801	1.3	3,489	3,761	3,961	4,061	5,025	5,184	5.9	547.2	649	1.6	12.5	5,833	4.6
Tulare	654	1.1	917	993	993	1,080	1,796	1,796	2.0	174.6	957	3.9	53.3	2,753	2.16
Los Angeles	23,361	37.8	22,131	21,772	21,556	23,153	26,372	27,056	30.8	15.8	6,454	16.1	23.8	33,510	26.3
Orange	13,000	21.0	14,150	14,199	14,199	13,727	12,478	12,232	13.9	6.0	285	0.7	2.3	12,517	9.8
Riverside	1,136	1.8	1,272	1,350	1,412	1,743	2,210	2,653	3.0	133.5	3,789	9.5	142.8	6,442	5.0
San Bernardino	1,129	1.8	1,829	1,873	2,191	2,500	2,838	3,507	4.0	210.6	7,443	18.6	212	10,950	8.6
Santa Barbara	4,600	7.4	4,785	4,800	5,200	5,500	5,750	5,600	6.4	21.7	520	1.3	9.3	6,120	4.8
Ventura	10,005	16.2	10,933	11,244	11,795	12,173	13,483	15,329	17.5	53.2	8,365	20.9	54.5	23,694	18.6
All others south of Tehachapi	430	0.7	444	452	512	516	549	560	0.64	30.2	987	2.5	176.2	1,547	1.2
All others north of Tehachapi	2,975	4.8	3,505	3,990	4,544	5,145	5,802	6,456	7.4	117.0	4,980	12.5	77.1	11,218	8.8

Sources of data: Figures for acreage 1924 to 1928 from annual reports of California Cooperative Crop Reporting Service, 1923–1927. Acreage for 1921 and 1929 from N. I. Nielsen, Fruit Statistician, California Cooperative Crop Reporting Service.

All counties having less than one per cent of the total bearing acreage of the state in 1929 are included in "all others."

TABLE 17

Walnut Exports from China by Countries of Destination, 1912–1925*
(Thousands of pounds, i.e., 000, omitted)

Year	Unshelled							Shelled					
	United States	Hong-kong	British Ind.	Japan	Canada	Other countries	Total	United States	Japan	Canada	Other countries	Total	Total in terms of whole walnuts
1912	374	1,116	150	177	†	659	2,476	3	†	†	22	25	2,531
1913	2,718	1,232	302	1,601	†	930	6,783	5	2	†	63	70	6,938
1914	1,852	681	283	3,204	†	186	6,206	201	268	†	75	644	7,415
1915	1,183	1,543	340	3,312	1	166	6,545	108	358	43	24	533	7,729
1916	1,367	1,204	255	7,361	49	538	10,774	441	994	90	36	1,561	14,243
1917	1,168	1,485	213	1,160	1	114	4,141	703	385	29	18	1,135	6,663
1918	65	688	176	264	†	77	1,270	230	1,457	185	167	2,039	5,801
1919	5,379	919	179	6,154	†	463	13,094	2,488	2,275	695	44	5,502	25,321
1920	791	749	293	599	152	31	2,615	2,185	844	247	39	3,315	9,982
1921	9,778	643	239	3,873	135	123	14,791	2,040	668	750	21	3,479	22,522
1922	2,152	636	319	563	276	66	4,012	1,608	703	779	48	3,138	10,985
1923	1,082	1,121	313	574	260	286	2,636	1,369	322	689	44	2,424	8,023
1924	4,479	883	218	1,279	549	176	7,584	2,113	614	808	237	3,772	15,966
1925	3,754	952	255	1,542	941	85	7,529	3,617	756	729	115	5,217	19,122
Average: 1912–1916	1,499	1,155	266	3,131	10	496	6,557	152	324	27	44	547	1,772
1921–1925	4,249	847	269	1,566	432	147	7,510	2,149	613	751	93	3,606	15,573
Per cent of total exports:													
1912–1916	22.9	17.6	4.0	47.7	0.2	7.6	100	27.8	59.2	4.9	8.1	100	
1921–1925	56.6	11.3	3.6	20.8	5.8	1.9	100	59.6	17.0	20.8	2.6	100	

* For method used in converting shelled to whole nuts see footnote, p. **35**. † Included in other countries, if any.

Source of data: 1920–1925, U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts, **W26**: 7 (*mimeo.*) Oct. 5, 1927. ("Foreign news on nuts" gives "China, Maritime Customs," as its source.) 1912–1919, compiled from: China, Maritime Customs, Inspector General of Customs Return of Trade, 1912–1919. Data in Maritime Customs are given in piculs, which were converted into pounds by multiplying by 133⅓.

TABLE 18

WALNUT EXPORTS FROM ITALY BY COUNTRIES OF DESTINATION, 1907–1926
(Thousands of pounds, i.e., 000, omitted)

Year	United States	Great Britain and Ireland	Switzerland	France	Austria Hungary	Germany	Greece	Argentina	Brazil	Uruguay	Other countries*	Total exports
1907	3,362	675	209	188	149	47	†	195	29	26	336	5,216
1908	3,999	1,262	286	177	11	72	†	215	76	12	408	6,518
1909	5,771	1,123	591	252	41	284	†	348	143	47	308	8,908
1910	8,241	904	428	1,309	185	194	5	86	91	58	951	12,452
1911	5,278	1,241	364	394	205	16	†	632	101	73	353	8,657
1912	3,005	970	667	645	681	560	†	180	175	27	439	7,349
1913	6,813	815	366	179	114	45	†	27	138	20	377	8,894
1914	5,808	922	733	93	261	3,469	†	11	53	6	474	11,830
1915	8,359	1,249	59	399	17	9	†	181	135	40	577	11,025
1916	7,650	959	91	988	†	†	121	54	97	5	990	10,965
1917	6,407	716	135	326	†	†	452	11	†	†	434	8,481
1918	334	208	22	64	†	†	544	†	†	†	433	1,605
1919	7,009	540	456	283	†	†	100	29	44	27	627	9,115
1920	5,394	722	548	24	352	1,088	178	472	260	34	1,091	10,163
1921‡	9,289	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,562
1922	8,341	1,103	665	870	†	†	†	†	†	†	1,321	12,300
1923	10,373	2,046	668	351	†	†	†	†	†	†	2,859	16,297
1924	9,358	927	815	760	†	3,345	†	†	†	†	1,445	16,650
1925	12,057	1,057	620	1,786	†	1,443	†	†	†	†	1,496	18,459
1926	12,837	1,500	200	1,897	†	434	†	†	†	†	1,899	18,767
Average: 1910–1914	5,829	970	512	524	289	857	1	187	112	37	519	9,836
1922–1926	10,593	1,327	594	1,133	†	1,044	†	†	†	†	1,804	16,495
Per cent of total exports:												
1910–1914	59.3	9.9	5.2	5.3	2.9	8.7	.....	1.9	1.1	0.4	5.3	100
1922–1926	64.2	8.0	3.6	6.9	†	6.4	.....	†	†	†	10.9	100

* Including exports to Eritrea, Tripolitania, and Cirenaica.

† Included in other countries, if any.

‡ Exports by countries of destination not available for 1921. Total furnished by U. S. Dept. Agr., Bur. Agr. Econ.

Sources of data: 1907–1920, compiled from: Movements Commerciale, Statistica del Commercio Speciale di Importazione e di Exportazione, *table* **1028**. Original data were in quintals and were converted into pounds by multiplying the figure by 220.46. Data for 1922–1926 are taken from: U. S. Dept. Agr., Bur. Agr. Econ. Foreign news on nuts **W21**: 3. (*mimeo.*) Aug. 24, 1927. Figures include both shelled and unshelled nuts. Prior to 1926 the exportation of shelled nuts was insignificant.

TABLE 19

Walnut Exports from France by Countries of Destination, 1910–1928
(Thousands of pounds, i.e., 000, omitted)

Year	United States	Great Britain	Germany	Belgium and Luxemburg	Netherlands	Switzerland	Canada	Sweden	Norway	Denmark	Egypt	Other foreign	French colonies countries	Total
1910	8,001	17,001	2,682	1,271	271	871	299	*	*	468	371	395	881	32,511
1911	8,079	22,741	9,674	5,701	487	4,819	534	115	*	1,125	254	214	838	54,570
1912	7,629	32,123	5,034	3,505	729	3,239	554	125	*	1,086	444	721	1,246	56,436
1913	10,737	24,372	6,762	898	1,743	2,852	552	*	*	1,082	277	577	775	50,626
1914	8,716	14,110	587	89	*	235	178	*	93	*	95	324	849	25,276
1915	17,511	17,015	*	*	159	695	254	184	95	758	249	197	748	37,864
1916	22,792	11,774	*	40	224	489	229	211	175	373	668	193	846	38,014
1917	13,263	14,808	*	83	*	481	187	5	15	24	227	51	460	29,607
1918	6,526	9,244	*	34	*	210	14	*	*	*	52	43	422	16,546
1919	8,839	9,902	*	272	*	491	*	*	316	442	*	577	325	21,163
1920	14,747	15,974	2,060	1,031	675	1,848	703	437	497	674	592	387	1,056	40,680
1921	12,949	16,924	294	1,277	480	1,144	657	330	265	448	280	133	849	36,080
1922	12,527	22,835	122	950	692	720	440	414	417	423	121	378	694	40,734
1923	10,675	28,952	296	1,291	1,554	1,225	526	405	*	651	517	813	656	47,560
1924	20,312	22,368	5,832	1,775	3,083	1,304	1,130	452	554	488	284	765	709	59,059
1925	24,731	21,746	10,793	4,077	1,973	1,432	2,198	412	296	862	220	357	1,103	70,200
1926	25,779	9,571	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37,660
1927	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1928	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average:														
1910–1914	8,632	22,069	4,948	2,293	646	2,403	423	48	19	752	288	444	918	43,884
1921–1925	16,239	22,565	3,468	1,874	1,557	1,165	990	403	306	574	284	500	802	50,727
Per cent of total exports:														
1910–1914	19.7	50.3	11.3	5.2	1.5	5.5	1.0	0.1	.....	1.7	0.6	1.0	2.1	100
1921–1925	32.0	44.5	6.8	3.7	3.1	2.3	1.9	0.8	0.6	1.1	0.6	1.0	1.6	100

* Included in "other foreign countries," if any.

Sources of data: France—Direction Generale des Donanes, Tableau General du Commerce. Original data were in quintals which were converted on basis of 1 quintal+220.46 pounds. French export statistics do not show quantities of shelled and unshelled nuts separately, hence the above figures are not comparable with other tables.

TABLE 20

MONTHLY IMPORTS OF UNSHELLED WALNUTS INTO THE UNITED STATES BY COUNTRY, 1924–25 TO 1927–28

(Thousands of pounds, i.e., 000, omitted)

	France	Italy	Spain	Roumania	China	All other countries
1924–25						
October	100	3,216	11	.....	83	5
November	5,071	3,864	*	176	2,475	547
December	1,219	3,060	9	66	1,007	62
January	1,116	532	.....	.....	553	13
February	285	30	6	44	318	.....
March	519	412	.....	.....	1,259	679
April	241	287	.....	.....	506	229
May	447	34	.....	.....	173	697
June	13	32	.....	163	*	215
July	.....	6	.....	211	*	39
August	49	32	.....	80	.....	146
September	.....	62	.....	32	.....	66
Total	9,060	11,567	26	772	6,374	2,698
1925–26						
October	28	2,448	33	.....	100	132
November	4,612	5,229	62	120	1,993	893
December	1,317	820	3	373	57	259
January	493	266	6	284	34	85
February	5	10	.....	22	9	93
March	.....	68	.....	146	.....	20
April	.....	105	.....	87	.....	.....
May	6	19	.....	22	203	.....
June	288	.....	.....	.....	.....	.....
July	1,118	43	.....	.....	28	232
August	15	117	.....	.....	.....	18
September	169	270	.....	.....	25	1
Total	8,051	9,395	104	1,054	2,449	1,733
1926–27						
October	370	2,510	.....	.....	525	50
November	374	8,343	.....	793	4,142	1,038
December	517	770	.....	1,234	449	229
January	143	23	.....	.....	132	11
February	194	*	*	.....	190	4
March	316	*	.....	22	192	62
April	49	5	.....	.....	15	23
May	55	*	.....	.....	200	57
June	246	.....	.....	.....	1	387
July	268	.....	.....	.....	*	280
August	198	1	.....	.....	.....	178
September	59	.....	.....	.....	.....	69
Total	2,789	11,652	*	2,049	5,846	2,388

* Less than 500 pounds.

TABLE 20 (*Concluded*)

	France	Italy	Spain	Roumania	China	All other countries
1927–28						
October	195	2,074			70	20
November	999	2,039			2,279	299
December	173	441	7		86	98
January	14	1		5		5
February	54	1				
March	50	1		2	25	
April	43				41	1
May	86				25	4
June	103				5	34
July		10				171
August	227					
September	157					61
Total	2,101	4,567	7	7	2,531	692

Sources of data: Figures for 1924–25 to 1926–27 from: U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts **W32**: 4–6. (*mimeo.*) Dec. 15, 1927. Data for 1927–28 compiled from: U. S. Dept. Com. Bur. For. and Dom. Com. Imports of walnuts and peanuts into the United States, by countries. (*mimeo.*) Figures for last year are preliminary and subject to revision.

TABLE 21

MONTHLY IMPORTS OF SHELLED WALNUTS INTO THE UNITED STATES BY COUNTRY, 1924–25 TO 1927–28

(Thousands of pounds, i.e., 000, omitted)

	France	Italy	Spain	Roumania	China	All other countries
1924–25						
October	580	260	51		2	3
November	795	75			18	39
December	1,418	19	61		151	33
January	2,443	40	122	26	418	102
February	3,768	27	347	48	390	169
March	2,534	57	129	58	866	167
April	2,152	82	97	39	760	194
May	1,280	87	152	14	470	131
June	1,202	102	73	6	304	46
July	192	1	2	8	115	15
August	21			4	126	
September	469				11	14
Total	16,854	750	1,034	203	3,631	913
1925–26						
October	828	25	6			40
November	940	30	71			36
December	1,608	16	44	7	104	120
January	2,415	39	113	28	420	8
February	2,660	25	81	3	497	136
March	3,163	19	76	72	468	82
April	1,871	86	54	153	836	45
May	1,845	16	192	171	307	102
June	1,464	46	113	62	135	22
July	667	47	6	11	42	13
August	194	35	3	0	67	34
September	179	7	0	0	97	33
Total	17,834	391	759	507	2,973	671
1926–27						
October	888	69	14	53	0	57
November	460	62	11	6	140	15
December	758	37	61	73	430	180
January	1,180	44	175	152	1,274	188
February	1,192	56	83	56	1,641	552
March	1,141	19	40	151	1,989	472
April	911	9	59	194	1,066	385
May	667	10	133	14	838	183
June	759	10	3		560	23
July	377		16		91	42
August	101					15
September	154	12				4
Total	8,588	328	595	699	8,029	2,116

TABLE 21 (*Concluded*)

	France	Italy	Spain	Roumania	China	All other countries
1927–28						
October	249	43	8	0		20
November	766	32			7	29
December	1,265	28	11		6	1,310
January	1,982	17	54	3	117	48
February	2,227	17	123		116	216
March	1,875	22	19		383	187
April	1,094	17	85	21	372	136
May	1,245*	22		11	451	63
June	1,217	1		3	410	117
July	322	4			18	27
August	22					87
September	129					51
Total	12,393	203	300	38	1,880	2,291

* May value for France was listed for Austria but as it seemed this value should have been for France instead of Austria it is listed here as imports from France.

Sources of data: Figures for 1924–25 from: U. S. Dept. Agr. Bur. Agr. Econ. Foreign news on nuts **W32:** 4–6. (*mimeo.*) Dec. 15, 1927. Data for 1927–28 compiled from: U. S. Dept. Com. Bur. For. and Dom. Com. Imports of walnuts and peanuts into the United States, by countries. (*mimeo.*) Figures for last year are preliminary and subject to revision.

TABLE 22

IMPORTS OF WALNUTS INTO UNITED STATES BY MONTHS FOR CROP-SALES YEARS, 1912–13 TO 1927–28

(Thousands of pounds, i.e., 000, omitted)

UNSHELLED

Oct. 1 to Sept. 30	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1912–13	1,105	8,161	3,354	443	331	299	834	1,226	385	1,129	559	1,110
1913	3,105	10,982	6,992	1,683	776	583	197	449	702	598	464	326
1914	2,562	4,411	9,716	1,712	1,214	334	562	416	23	37	19	80
1915	2,470	7,519	7,490	2,594	725	744	248	280	425	202	645	255
1916	882	4,924	10,970	4,102	1,321	519	1,148	488	211	266	505	241
1917	1,081	2,158	5,139	1,160	641	402	280	155	107	*	*	*
1918	*	109	451	368	102	225	349	910	827	729	1,765	821
1919	1,120	5,322	8,798	4,040	1,596	1,200	888	879	121	342	51	89
1920	1,136	2,912	2,819	868	453	335	413	1,678	1,430	2,083	2,333	966
1921	3,409	9,828	9,619	7,626	2,114	2,459	1,813	482	475	259	416	216
1922	1,096	9,722	5,150	969	403	275	305	532	570	11	4	53
1923	1,797	10,623	2,766	280	336	370	459	999	547	615	292	241
1924	3,415	12,133	5,413	2,214	683	2,869	1,263	1,351	423	256	307	160
1925	2,741	12,909	2,829	1,168	139	234	191	250	288	1,421	150	465
1926	3,455	14,690	3,199	309	388	592	92	312	634	548	377	128
1927	2,359	5,596	805	25	55	77	85	115	142	181	227	218
1928	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

SHELLED

1912–13	519	967	1,093	1,358	1,670	1,922	1,041	954	694	113	17	143
1913	604	516	1,069	1,082	1,376	1,593	1,217	748	449	72	2	30
1914	162	180	869	1,326	1,664	2,197	1,822	1,422	1,362	376	80	201
1915	553	851	1,349	1,777	2,044	2,001	1,909	1,602	1,487	709	249	171
1916	414	597	1,026	1,341	1,305	2,167	2,401	1,151	1,529	479	266	90
1917	196	313	1,020	402	1,236	1,319	1,737	2,576	1,523	512	170	102
1918	60	24	47	655	741	567	804	2,649	1,365	505	769	55
1919	615	300	1,236	1,326	2,892	3,700	2,663	1,889	1,554	775	299	225
1920	88	130	277	735	1,601	1,854	1,983	1,029	1,646	339	46	56
1921	313	878	2,852	3,213	2,909	2,058	1,407	1,403	1,554	105	99	295
1922	764	852	1,550	2,498	2,325	3,356	2,829	2,085	848	348	98	377
1923	1,110	1,096	1,276	1,653	3,454	2,748	3,315	2,270	1,021	350	84	819
1924	896	907	1,682	3,151	4,749	3,811	3,324	2,134	1,733	333	151	494
1925	899	1,077	1,899	3,023	3,402	3,880	3,045	2,633	1,842	786	333	316
1926	1,081	694	1,539	3,013	3,580	3,812	2,624	1,845	1,355	526	116	162
1927	320	834	1,386	2,221	2,698	2,486	1,725	1,792	1,748	371	109	180
1928	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Less than 500 pounds.

Sources of data: Monthly Summaries of Foreign Commerce of United States, July, 1912, to Dec., 1927. Later figures compiled from: Imports of walnuts and peanuts into the United States. (*mimeo.*) Bureau of Foreign and Domestic Commerce, U. S. Dept. Commerce. For totals see table 11. The totals will not always correspond exactly with the sums of the above monthly figures since the latter are in part unrevised.

TABLE 23

OPENING PRICES AS NAMED IN THE ORGANIZED WALNUT INDUSTRY

Year	Date of naming opening prices	Opening prices as named by walnut associations of southern California*					Prices paid by Santa Ana Association to members for No. 1 Soft Shell†
		No. 1 Soft Shell	No. 2 Soft Shell	No. 1 Hard Shell	No. 2 Hard Shell	Budded	
		cents	*cents*	*cents*	*cents*	*cents*	*cents*
1896	Sept. 15	8	6	6½	4½		
1897		9	7	7½	5½		
1898	Aug. 8	7	5	6	4		6.43
1899	Sept. 23	8¾	7¾	8¼	7¼		7.41
1900	Sept. 15	10	8	9½	7½		9.50
1901	Sept. 21	9½	7½	8	7		8.52
1902	Sept. 13	10	8	9½	7½		9.44
1903	Sept. 16	12½	10½	12	10		11.94
1904		11	9	10½	8½		10.44
1905	Sept. 23	13	9	12½	8½		11.84
1906	Sept. 8	11	8	10½	7½		10.02
1907	Sept. 21	15	12	14½	11½		13.55
1908	Sept. 15	12½	8½	12	8½		10.74
1909	Sept. 26	11½	7½	11	7½		10.65
1910	Sept. 26	15	11	14½	11	17½	14.05
1911	Sept. 30	14	11	13½	11	16½	12.50

		Opening prices of California Walnut Growers Association‡ (old organization discontinued)				
		No. 1 Soft Shell	No. 1 Standard Hard Shell	No. 2 Soft Shell and Hard Shell	Fancy Budded	Standard Budded
		cents	*cents*	*cents*	*cents*	*cents*
1912	Oct. 5	14	13½	10	16½	
1913	Oct. 4	16	15½	11½	19	
1914	Sept. 24	16½	¶	12	20	
1915	Oct. 2	13.6		10.6	17	
1916	Sept. 30	15½		12½	19	
1917	Oct. 2	20.1		16.1	24.1	21.1
1918	Oct. 1	28		25	31.5	29
1919	Oct. 1	31½		26	34	32
1920		22½		16½	25½	22½
1921		24½		17	28	24½
1922	Oct. 3	22½		17½	26	22½‖
1923	Oct. 4	22		15	26	
1924	Oct. 9	25		16	29	25
1925	Sept. 30	24		15	29	22

		Diamond No. 1	Diamond large budded	Diamond medium budded	Emerald No. 1	Emerald large budded	Emerald medium budded	Emerald babies
		cents	*cents*	*cents*	*cents*	*cents*	*cents*	*cents*
1926		28	32	25	25	28	23	18
1927	Oct. 5	21	25	19	18½	22½	17	13
1928	Oct. 8	26	28½	25	23	25	22	18½

(Footnotes on page 60)

TABLE 23 (*Concluded*)

FOOTNOTES

* Opening prices as named by the Walnut Associations of southern California from 1896 to 1912 were compiled from the annual reviews of the walnut industry as published in the annual review number of the Calif. Fruit Grower from 1896–1912. The figures have been checked against the market reports of the Pacific Rural Press and agree rather closely with them.

† These prices represent the prices paid by a large local to its members after all commission charges and local association expenses have been deducted from the opening price. The price series is as reported in: Calif. Walnut Growers Assoc. The walnut in California, *p.* **58**. Calif. Walnut Growers Assoc., Los Angeles, 1919.

‡ These figures have been compiled from the market and annual reviews of the Calif. Fruit Grower (later Calif. Fruit News) and have been checked against current market quotations in the Pacific Rural Press, the Western Canner and Packer, Bul. **379** (of the University of California), and with memoranda in the office of the Calif. Walnut Growers Assoc. As the latter source appears to be a compilation, some slight discrepancies occur, but, except in recent years, the figures from other contemporary sources have received preference.

§ Standard budded have at times also been called "Golden State Budded."

¶ The grade of No. 1 Standards became relatively insignificant due to the elimination of the hard-shell walnut. Although some are grown the larger sizes are thrown into No. 1 Soft Shell and the smaller sizes go in with the smaller sizes of No. 2 Soft Shell. The No. 2 Soft Shell have been given the trade name of "Baby Soft Shell" by the Association.

‖ Only a few Standard Budded—mixed with other grades.

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314. Termites and Termite Damage.

The publications listed above may be had by addressing

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